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CALIFORNIA

SAFETY NEWS

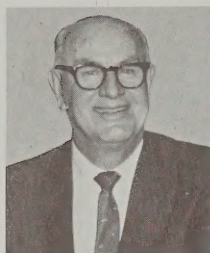
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UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

APRIL, 1969





Chiefly speaking

Progress is always measurable over the long-term, particularly when dealing with the complexities of industrial safety. But it so often seems that efforts to solve the problems of industrial safety show little gain when viewed over the short term of days and weeks.

It was rewarding, therefore, to listen to speakers at the 1969 Governor's Industrial Safety Conference praise the long-term gains for worker safety achieved in California in recent years.

The record of the past decade and of the past few years deserves praise.

Lost-time injuries rose between 1958 and 1968, but at a much slower rate than growth of the labor force.

The job-injury rate declined significantly at the same time. The rate set a record low of 30.8 per thousand workers in 1967, and was nearly as low—30.9—in 1968.

That is a safety record management and labor can be proud of. Their contributions did the job where it counts most—on the firing line with workers on the job.

The State Division of Industrial Safety can also share in the praise, and rightly so. Activities of the Division in 1968 were at a peak. Its safety engineers made over 148,000 original surveys and were successful in correcting one-quarter million unsafe working conditions. Our engineers also made more than 47,000 special calls at work places, and investigated 6,000 complaints from California employees.

The Division's educational program was also active, giving renewed vigor to regional meetings of the GISC. There were 44 area sessions in 1968, and they did much to educate and motivate for greater safety participation. Added to this, our engineers spoke at meetings throughout California, showing films and distributing safety brochures.

What can we in government do in the coming year to once again advance the cause of industrial safety?

We can strive cooperatively—with management and labor helping—for that small measure of progress. We can all see now the success it is possible to achieve by taking one safety step at a time.

With this proof of progress, little by little let us continue moving forward toward our goal of making California the safest place in the world to work.

Jack F. Hatton

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CALIFORNIA SAFETY NEWS

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RESEARCH AND EDUCATION

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Educating them to work safely

**Robert J. Wayne, Director of Safety,
Kaiser Steel Corporation**

When the needs of the disadvantaged are brought to our attention we too often tend merely to recognize the problem, nod in concern, comment that something has to be done and that "they" had better get at it quickly. And with this comforting delegation of responsibility, we return to our daily routines.

But what if you work for a "can do" outfit; an organization with lots of heart; one that doubts that George can do it alone; is dubious of governmental panaceas; has historically held a position in the vanguard of equal employment opportunity; and has a chairman of the board named Edgar Kaiser. The answer is self-evident—you vigorously attack the problem with an affirmative action program.

What we will share with you today is Kaiser Steel's multifaceted attack on this problem, its ramifications, facts and analyses. In view of our mutual concern with safety, there will be emphasis also placed on this subject. In looking back over our efforts, with some successes and some efforts that were not too successful, we must reiterate that we are conducting an attack on the problem with the attack being modified to meet varying conditions as they arise. This presentation today is not offered as a patented solution; but merely as a resume of the way we went about fitting a handle on the various forms of this employment problem. Progress was made in 1968, and greater progress will be made in 1969.

The Kaiser Companies have had a non-discriminatory employment policy in effect for a number of years. In 1962, it became both desirable and important that this policy be given new emphasis. Accordingly, the Affiliated Kaiser Companies voluntarily formulated a plan in which they pledged to advance employment opportunities for minority groups through the initiation of aggressive affirmative action programs. Our "Plan for Progress" developed under the auspices of the then-existing president's committee on equal employment opportunity and signed with the Vice President, stimulated self-evaluation, internal communication, and implementation of various equal employment opportunity programs in our companies. We made progress in recruiting, employing, training, and upgrading minority employees—but this first effort frankly lacked the personal commitment throughout all levels of management.

Under renewed directives from top management during the early months of 1968, our programs were intensified and strengthened. In addition, the Kaiser Companies, recognizing they have a further public responsibility to devise programs which will provide the opportunity for employment of the so-called hard core unemployed, amended their "Plan for Progress". The objectives of the amended plan are to (a) accelerate the recruitment and employment of qualified minority persons and (b)



Willie Lee Fowler, a hot strip mill worker at Kaiser's Fontana plant, was a hard core unemployed trained by the Oakland company.

to develop and aggressively implement specific affirmative action programs designed to increase the employment of minority persons who have, heretofore, been considered unemployable even under Kaiser's relaxed standards.

In order to attain these objectives, contact was made and maintained with all appropriate recruitment sources available to attract the qualified unemployed as well as the hard core unemployed, particularly from among minority groups; education and skills required to perform our hourly entry jobs were reviewed and, where feasible, reduced; employment test standards which did not appear to be realistic and fair to the habitually unemployed were waived; and a "rule of reason", with respect to work experience, police records, unsatisfactory military records, poor credit records and social back-

ground, was adopted to permit increased employment of those among the minorities who had heretofore been considered unemployable.

The Kaiser Steel Corporation, the host for our efforts, is comprised of approximately 12,000 employees of whom almost one in five are of an ethnic minority. The company's facilities consist of coal and iron ore mines, a fully integrated steel mill, several steel fabrication plants, and a corporate headquarters. These facilities are located in New Mexico, Utah and, primarily, in California. In 1968, we commenced our special disadvantaged employee program and hired approximately 300 participants. Programs were developed by each of our eight major locations to harness its resources and abilities so as to best respond to community needs in this problem area. The programs were also designed to attain the full affirmative commitment of the local management and employees.

Accordingly, the programs ranged from social and industrial education of disadvantaged high school children, through on-the-job training programs, to specially counselled hard core employment.

The hard core programs were established primarily at our Napa fabrication plant and at our Fontana steel mill. At Napa, independently and in conjunction with Contra Costa and Napa Colleges, we established programs to develop entry level and welding skills. M.D. T.A. (Manpower Development and Training) contracts were executed with the Bay Area Urban League and the North Bay Human Development Corporation. These involved approximately 85 participants. The North Bay Human Development participants were primarily bilingual Mexican-Americans, which created special difficulties with language barriers. These problems were solved to a great extent by the participants voluntarily undertaking English lessons at public school classes during their nonworking hours. Our experiences at Napa and the results of our Napa program were very similar to that at our Fontana steel mill. I will report the results in detail.

Inasmuch as the remainder of this report will consider hard core unemployed, it would be appropriate to explain what Kaiser Steel Corporation means by the term "hard core". "Hard core", of course, is loosely used in everyday conversation, but there are many excellent definitions of this term within industrial and governmental circles. After having reviewed a number of these, we decided upon a definition for uniform application at all locations.

Let us now direct our attention to the steel mill program at Fontana. For the purpose of communication, we referred to the project as the "two-percent program." Under this corporate program the steel mill was committed to hire approximately 170 youths, two youths for every 100 regular employees. They actually hired 205. These youths were to be between the ages of 16 and 21, and they had to be from disadvantaged circumstances. Industrial welfare laws pertaining to minors prohibits the employment of youths under 18 years of age within the mill, and, for this reason, 194 of those hired were in the 18-21 age range. These, then, are the 194 steel mill hard core hired into entry jobs that we will discuss.

The other 11 disadvantaged youths, aged 16 to 18, were mostly school dropouts and were also hired. But because they were ineligible for entry jobs, they were provided one-half day of training in mathematics and

A hard core unemployed individual is: 1. unemployed or underemployed; 2. living at or below the poverty level cited in the appropriate family income table of the U. S. Department of Labor; and 3. is disadvantaged by one or more causative factors, such as: a. minority race or ethnic background; b. low achiever or illiterate; c. without skill or sufficient work experience; d. welfare case; e. significant police record; f. socially or emotionally maladjusted; g. health problems; h. non-English speaking; i. sub-cultural characteristics inhibiting employability.

language skills to help overcome deficiencies in their basic education. The other one-half day was assigned to provide work experience on jobs outside the mill areas. A credentialed teacher was employed to counsel and to work with this group. Transportation to and from the plant was provided. These young people were encouraged to return to school in September.

For administrative convenience, recruiting for the two-percent program was done through the Youth Opportunity Center. Other organizations, such as the Urban League, Operation Second Chance, The Mexican-American Opportunity Foundation, the Dependency Prevention Commission, and the National Association for the Advancement of Colored People cooperated in referring candidates to us through this center.

The Youth Opportunity Center provided assistance in processing necessary pre-employment paper work, was a central point to which we could send management representatives for talks with the applicants before their first entry into the plant, and was instrumental in obtaining a representative proportion of disadvantaged youth from each of the surrounding communities.

Applicants referred through the Youth Opportunity Center were hired upon satisfactorily completing a physical examination. Standards for prior work record, school record, domestic situation, arrest record and test performance for selection purposes were waived for this group; however, physical examination standards were maintained in recognition of industrial safety and health responsibilities. Following hire, each of the young men was interviewed, tested, and his reference checked. This information was gathered for post-hiring determination of job placement, need for training, counselling requirements, and for follow-up research. Departmental supervision was encouraged to interview each applicant but rejection for employment among this group was strongly discouraged unless very compelling factual reasons were provided.

Before reporting for work, these young men received a thorough orientation. In addition, they were briefed as to their rights and responsibilities as union members by officials of the United Steelworkers of America, which manifested a very progressive and constructive posture toward the entire steel mill program.

Prior to implementing the two-percent program, all levels of supervision were made aware of top management's solid commitment to the program and advised that their whole-hearted cooperation and participation were required and essential. It was pointed out that employees brought in under the program would be hard core from disadvantaged circumstances, and that because of their backgrounds, they might not have the same set

of values and standards generally found in new employees. It was emphasized that extra effort on the part of the supervisors would probably be required to help some of the young men adapt to the work environment and achieve the levels of performance normally expected.

In order to make the transition from unemployable disadvantaged to regular, productive employees as smoothly and rapidly as possible, the company assigned counsellors chosen from regular employees, workers, staff and supervisors, to assist in the program. Care was taken to ensure that those selected had a genuine interest in the program, strongly desired to participate, and were sensitive to the problems of the disadvantaged. A high proportion of the counsellors were, themselves, of minorities.

The role of the counsellor was to follow up the progress of the employee assigned to him and to provide whatever assistance he could to ensure the satisfactory adjustment of the employee to the industrial environment. As soon as the employee was working effectively in the department, the counsellor's role diminished. Carrying out his function, the counsellor was called upon to motivate, guide and encourage the employee, to analyze the employee's progressional sequence, and to suggest outside education that would be needed for eventual upgrading. He also assisted the new employee with personal problems (any that he wished to discuss), ascertained special skills and talents the employee had, and encouraged their development for possible job advancement. Additionally, he assisted line supervision in assessing the employee's performance, assisted in evaluating the need for the type of discipline, and would request extensions of the probationary period when appropriate.

The two-percent program hard core were hired into regular entry jobs. Educationally, 67 percent of the group failed to complete high school, and 33 percent claimed high school graduation or better. The average test performance for the group was 14 percent below the steel mill's minimum. These tests included intelligence, shop arithmetic, mechanical knowledge, spatial relations, and mechanical comprehension.

Fifty-seven percent of the group admitted having been arrested at least one time. Offenses included such things as minor in possession of alcohol, petty theft, curfew violations, intoxication and some relatively major charges. Forty-three percent claimed no arrest; however, a subsequent cursory check indicated this figure was probably high. Seventy-three percent of the group were single; 25 percent were married; and 2 percent were married but separated from their wives.

Of our original group of 194 hard core hired at the steel mill, 58 percent or 113 remain in our employment. In examining the 42 percent that terminated their employment with Kaiser Steel, 15 percent voluntarily quit, 14 percent were terminated for absenteeism, 7 percent were terminated for unsatisfactory work performance and 6 percent were terminated for other reasons, such as entry into the armed forces, a determination, subsequent to the date of hire, failure to meet the physical examination standards, etc.

At the same time we researched the hard core performance, we also researched the records of a group of non-hard core, non-disadvantaged employees who met all of our selection criteria and who were hired into similar jobs during the same period. These records show that

At the steel mill during the three quarters of study, the all-injury frequencies by quarter were as follows:

	Hard Core	Non-Hard Core
Quarter 1 _____ (The hard core started off at approximately 32 per- cent higher)	1015	and 769
Quarter 2 _____	635	and 572
Quarter 3 _____	585	and 393

The improvement in both groups from the first quarter data to the third quarter data was relatively similar. The hard core improved by 42 percent, and the control group by 49 percent.

41 percent have broken continuous service for similar reasons. The difference between the 41 percent and the 42 percent are statistically significant only in their similarity.

During an employee's probationary period at the steel mill, he is rated concerning quality of work, quantity of work, dependability, initiative, attitude and safety. The employee's supervisor rates him on a scale of poor, fair, good, or very good. We recognize these types of ratings are subjective; however, our analysis of the hard core versus the control group establishes that the median rating for these six factors was the same for both groups, except for dependability and initiative. In these two factors the hard core group rated lower. Considering the differences in education and environment of these two groups, we consider that the data of significance provided by this comparison are that both groups rate within the same range for quality of work, quantity of work, attitude, and safety. We expect our hard core affirmative action program to eliminate all differences.

In analyzing factual data related to dependability and initiative, we found absenteeism to be a major factor. Forty-nine percent of the hard core were warned concerning absenteeism, compared to 14 percent of the control group. Thirteen percent of the hard core were warned about tardiness, compared to 6 percent of the control group, and 6 percent of the hard core were warned concerning leaving their jobs without supervisory approval, compared to none in the control group. A number of performance slips issued to either group for other reasons were statistically insignificant.

Whenever a hard core hiring program is considered, there is a great deal of conjecture concerning physical fitness. We analyzed the physical fitness of 154 hard core employees who were examined for hire during the peak of the program, with 362 non-hard core as a control group during the same peak period. Five of each group—that is, of 154 and of 362—were not hired due to physical reasons. Kaiser Steel Corporation's medical director in charge of this evaluation advised that he and the other physicians who conducted the health examinations consider that the hard core employees and non-hard core who were examined were not significantly different physiologically.

Turning now to safety considerations in employing the hard core, we assumed at the outset that our hard core employees, compared to our regular employees, would be more vulnerable to on-the-job injury due to

their relative lack of industrial experience. In attempting to compensate for this possibility, the safety elements of our orientation and training processes were strengthened, and particular emphasis was placed on restatement and review of safety methods, rules, and procedures. Specific area hazards were discussed both in the basic orientation and in weekly departmental meetings. The importance of wearing protective gear, such as hard hats, safety glasses, hard toe shoes, earplugs and appropriate clothing were covered repeatedly. We cannot overstate the importance of repetitious instructions to hard core personnel. We soon discovered that they expressed their appreciation for employment by indicating an understanding of the directions and the reasons for safety procedure which was far beyond their comprehension of the hazards inherent to the work.

During our safety study of the nine months of hard core and control group employment, there were no D. I.'s (disabling injuries) suffered by the hard core group, nor were any suffered by the Napa group of hard core employees during a similar period of study. All data concerning measurements of work injury experience are in conformity with USASI (USA Standards Institute) standard Z16.1.

The all-injury frequency for the hard core was significantly greater than the control groups at both Napa and Fontana. At the steel mill the all-injury average frequency for the nine-month study was 681 injuries per million man hours for the hard core as compared to 535 for the regular hires. The overall average for the entire mill was 150. These two study groups had comparative

Aside from study analysis, what have we learned from our experience to date? What we learned fairly well corresponds with what others similarly involved have learned.

First, any program to hire the hard core must have the total commitment of top management, and that commitment, along with a sense of urgency, must be effectively transmitted down the supervisory line. People at all levels have to know that top management is serious and intends to obtain compliance.

Second, recruitment requires aggressive procedures, including utilization of civic and minority organizations (moderate and militant alike) with whom the hard core are likely to identify. Do not count on minority people breaking the doors down to your personnel office simply because you advertise that you are an equal opportunity employer.

Third, you need to reconsider, and, if necessary, revise hiring standards and hiring practices. You have to consider what being qualified really means. Do your entry jobs really require a high school diploma? Do they require the level of vocabulary and arithmetic for which you test? Employers need to re-examine all arbitrary employment standards. Remember that nearly all employment standards are arbitrary, and that very few have been validated scientifically.

Fourth, there will be special problems. Hard core takes more counselling and individual attention to remain motivated, and it may take a bit longer to train him on the job. This, however, does not mean you alter your plant's conduct or performance standards.

work experience and length of service; however, the hard core at the steel mill experienced approximately 27 percent more injuries than the non-hard core, while at Napa it was approximately 17 percent more.

Our analysis of the identity of the injured revealed that at the Napa fabrication plant, all injuries in both hard core and in the control group were experienced by 35 percent of the personnel in those groups, with one-half being repeaters.

At the steel mill, all injuries in the hard core group were experienced by 31 percent of the hard core personnel, and one-third of the injured were repeaters.

Turning our attention now to injury types between hard core personnel and the total steel mill population less the hard core personnel, we find that there were no significant differences in the injury types. The largest classification for both groups was lacerations, punctures, abrasions, and contusions. Ninety and seven-tenths percent of the hard core injuries were of this type, and 74.3 percent for the remainder of the plant. The second largest injury type for both groups was burns. The hard core injured suffered 8.2 percent, and the total plant, 13.3 percent. The third largest type was strains and sprains, with slightly over 1 percent for the hard core and 9.2 percent for the remainder of the plant. The difference in the percentages is considered to be type of job assignment that occurs with longer service.

Our nine-month analysis of the body member subject to injury also indicates a similarity of distribution. The largest category for both the hard core and for the remainder of the plant was fingers: 38.2 percent for the hard core; 33.8 percent for the remainder of the plant. The second largest category was hips, knees, and legs, with 19.1 percent for the hard core and 13.3 percent for the remainder of the plant. For both groups, the third category was shoulders, arms, forearms and wrists, and the fourth for both groups was hands. The composite percentages for these two categories were 27 percent for the hard core and 23 percent for remainder of the plant.

Our evaluation of the study data conclusively establishes that hard core personnel can be successfully trained for industrial employment. Special counselling of the disadvantaged program, orientation for their fellow workers, and training of their supervisors is essential. The hard core employment attrition rate was remarkably similar to that of the control group. Medically, the hard core met our physical standards as well as our regular employees. From a labor relations view, only in the areas of absenteeism and tardiness were the hard core a significant problem. Safetywise, although the hard core employees did not experience any disabling injury during the nine months of study, their all-injury experience was substantially greater than that of the control group, 27 percent greater at the steel mill, and 17 percent greater at our Napa fabrication plant.

No one institution in our country is better equipped to effectively exercise leadership in providing meaningful employment for the hard core unemployed than the business community. The time has come for all of us, large and small, to support equal employment with the same fervor and dedication as we now support cost control, product development, etc. A militant leader addressing a group of Detroit businessmen put it very well: He stated: "If you cats can't do it, it's never going to get done."

Planning safety pays off for all¹

**E. J. Lutz, Safety Engineer, Research and Education,
State Division of Industrial Safety**

For the city of San Diego, safety procedures during repair of an 84-inch diameter sewer tunnel at first appeared difficult to incorporate into the project. But the contractor and city and state engineers worked together to assure safe procedures.

The project called for replacing the polyvinyl chloride lining in the tunnel where blisters had formed, due to the disintegration of the tunnel wall, and had permitted ground water seepage to loosen the lining.

Originally, the work on the 475-foot reach was planned for two operations, each with an access casing 72 inches in diameter leading up to street level. Both sections were to be bulkheaded at each end, and a 30-inch diameter by-pass line installed around the bulkheads.

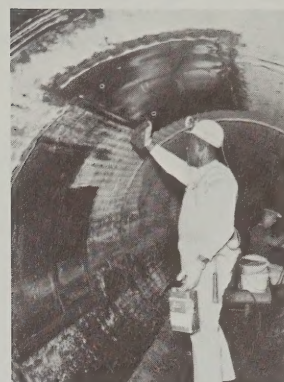
Studies had shown that the sewage could be retained and stored during the low flow, thus giving the contractor as much as seven hours of working time by using the by-pass line; however, several questions involving safety for the tunnel workers were not completely answered. The 30-inch by-pass line would only handle so much sewage. What would happen if storm water overloaded the line? It would be necessary, then, to remove the bulkheads. Could this be done safely? Could it be done quickly?

Sewage flow had increased from 34 million gallons a day to 42 million gallons since the by-pass line had been designed, and it was feared that the bulkheads under the high-pump pressure required for the diversion line could possibly fail; at least, there would be some danger for the workers.

To find a safer way, Bruce Kemper, vice-president, and Mert Miller, superintendent of Kemper Construction, met with Robert Mavis, the resident engineer for the City, and officials of the San Diego Engineering Department to work out safer methods. Also consulted were the State Division of Industrial Safety engineers Don Metzler and Alan Wharff. The experts decided that the repair project could be done in less time and under safer working conditions by eliminating the sewage by-pass system completely. A two-week trial period would test

¹Thanks are given to officials of the City of San Diego Engineering Department and the Kemper Construction Company for their aid in the preparation of this article.

This worker on the City of San Diego's sewer repair project was protected by cooperative safety planning before the job started.



the work without the by-pass line. Because bulkheads were also eliminated, work could be abandoned with minimum delay in case of storm or other emergencies.

The 24,000 cubic feet per minute displacement blower could function even better than planned, because it was operating through a manhole slightly upstream of the work and blowing downstream. By storing the sewage for a brief off-peak period, work could progress much more rapidly than if bulkheads had been built or a diversion line installed. Improved ventilation also made working conditions more pleasant.

By using the 84-inch line to the full capacity of the pumps and then storing the sewage, down-time (time when men could work in the tunnel) was as great as had been planned with the old method. This was possible because the 84-inch line could be used to its maximum without depending on the 30-inch by-pass line.

Tests were frequently made for the presence of hydrogen sulphide and methane, but ventilation was so good that gas was not a problem.

Repair work on the blisters proceeded at a rapid rate:

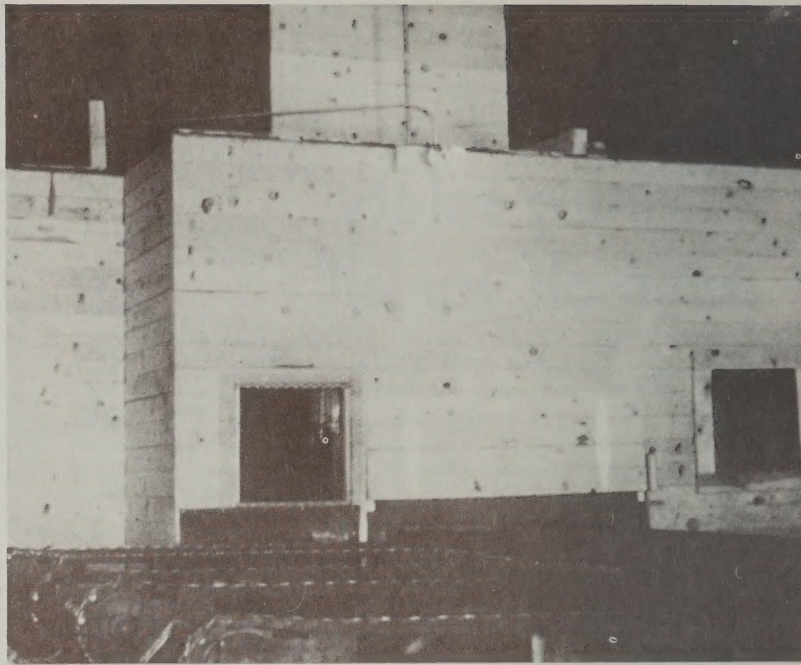
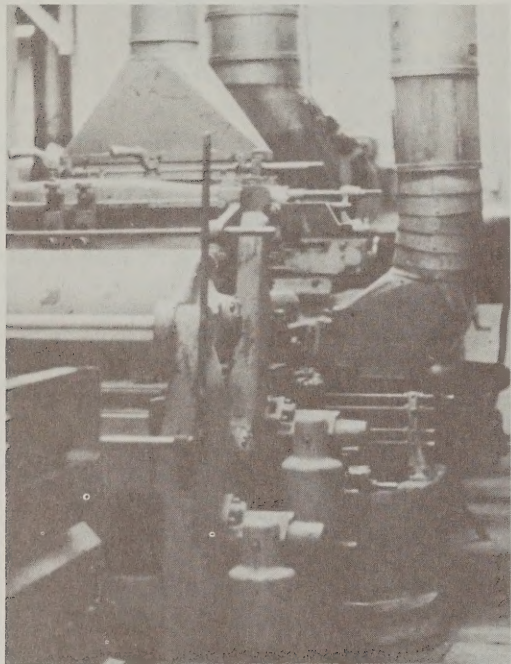
- Grout pumping was used to seal off water intrusion as required. All pockets in the concrete wall were chipped out to dense hard concrete.
- Wire mesh used was 14 ga ½ x ½ mesh welded wire, bolted to concrete;
- The T-lock liner was placed on the plywood forms with Epoxy glue around all edges, forms were shaped to proper radius and secured with screw type trench jacks, and cavities were pressure-grouted;
- Better patch control was obtained by the use of smaller patches whenever possible for the irregularly shaped cavities.

This job illustrates what has been proven many times—when work is planned with safety in mind, the job also turns out to be faster and better. Maximum cooperation was obtained between engineering, construction, and safety officials to cut down the time when workers would be exposed to the danger of working behind bulkheads.

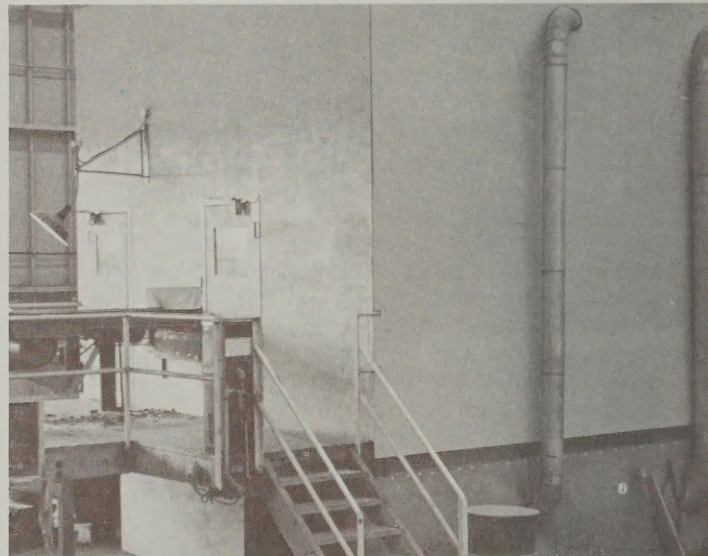
Cooperation between planning engineers and safety engineers is always worthwhile, and assures both a safe and efficient job.

Single-machine enclosure showing hinged closure over in-feed opening (between windows). This barrier in the closed position results in an additional reduction of 6 decibels in the feeder's noise exposure. Note the air intake chimney on the roof. This chimney contains internal baffles to block the noise path. The light bulb is part of a signal system to insure adequate communication between feeder, setup man, and graders.

This is a modern, high speed planer. Each cutting head is directly driven by a powerful electric motor. Such a machine can handle stock up to 24 inches wide. Noise levels as high as 124 decibels have been recorded in the vicinity of these machines.



Corner view of a good single planer enclosure. The side-mounted ductwork is neatly accommodated by the fine mill work. The open space between machine floor and the mill floor is effectively blocked off with sound absorbent baffling material.



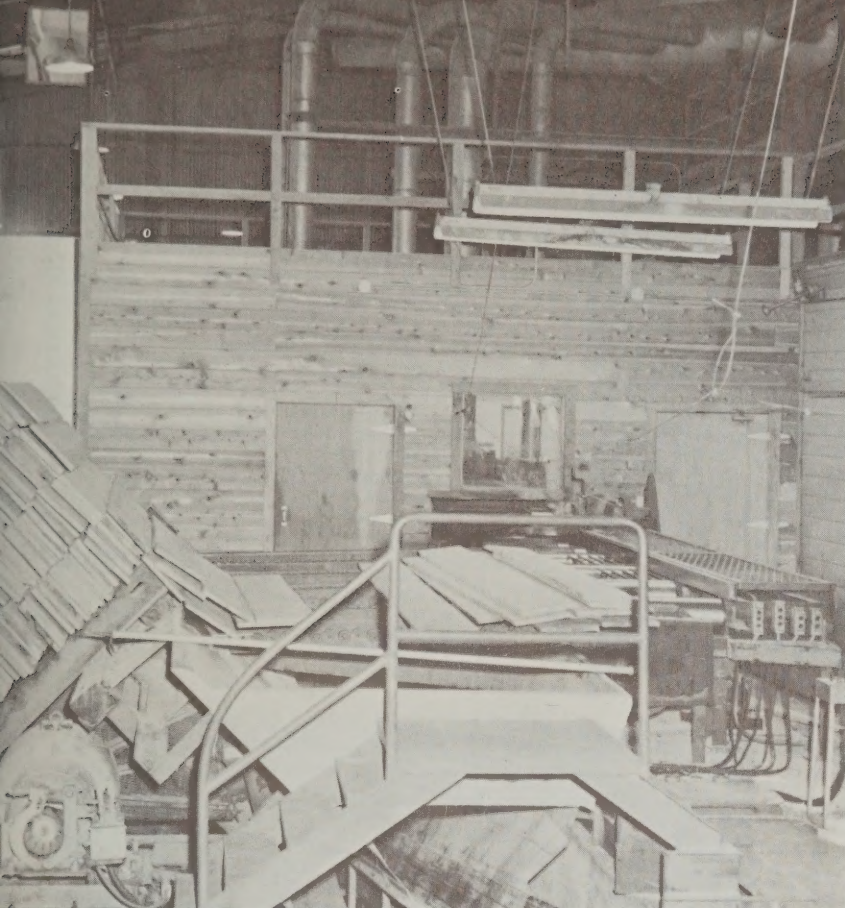
Planing mills control high noise levels

The modern, high-speed planer shown here is the heart of the California planing mill industry. Highly efficient from a production viewpoint, this machine also can develop nerve-shattering noise averaging about 115 decibels and at times as high as 124 decibels.

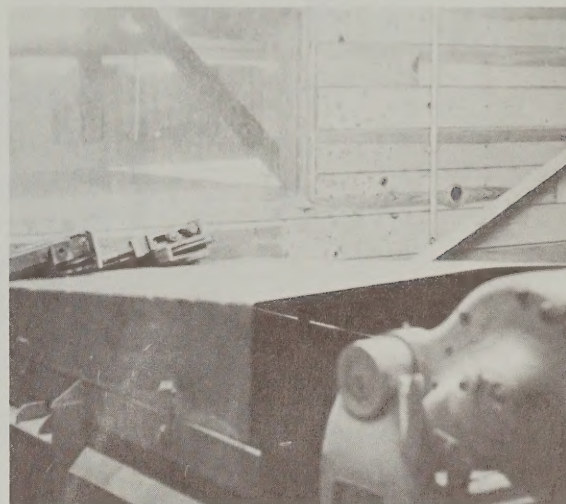
These noise levels are a danger to the hearing of mill workers continuously exposed to them. The California Noise Control Safety Orders are specific in the allowable noise levels to which any worker may be exposed. If the noise level equals or exceeds 95 decibels in any one octave band above 300 cycles per second for five hours or more in a normal working day, then some method of noise reduction must be instituted.

In recent years engineers of the State Division of Industrial Safety have worked with mill operators in Shasta, Siskiyou, Modoc, and Trinity Counties to develop controls for planer noise. The design and development of soundproof enclosures were first reported in the December, 1968 issue of the **California Safety News** by Ken Nobs, DIS industrial hygiene engineer, and Stanley A. Merrick, DIS industrial safety engineer.

Now the authors have collected a series of photographs to show construction details of effective planer enclosures. The installations are examples of how Northern California planing mills are successfully dealing with excessive high-noise levels.



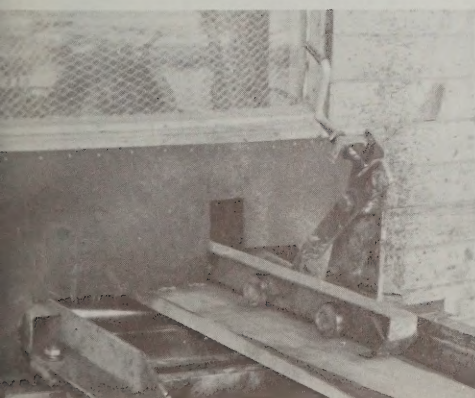
Well constructed, double-paned window over infeed opening gives adequate attenuation and provides visibility for planerman and feeder. Good lighting inside the enclosure is mandatory.



A rugged metal chute or tunnel must be provided to prevent a wayward board from tearing out the end wall of the enclosure. It also reduces hazard to setup man caused by flying pieces.

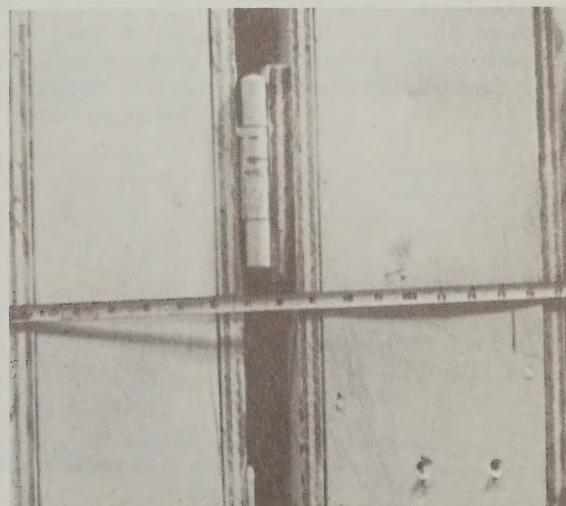


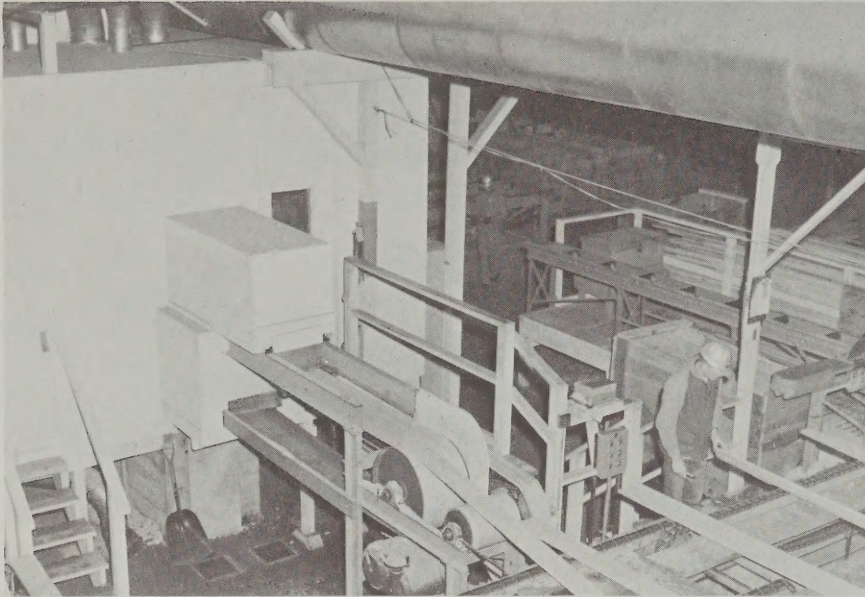
Outstanding example of outfeed tunnel. Planerman can inspect all surfaces of any board easily and safely. These key men must be consulted about their work procedures, and their requirements must be fitted into the enclosure design.



Baffling on an infeed opening. Similar baffling is required on inside of wall with offset slits in belting material. This represents the absolute minimum requirement. An enclosure can lose one-half its effectiveness through poorly treated openings.

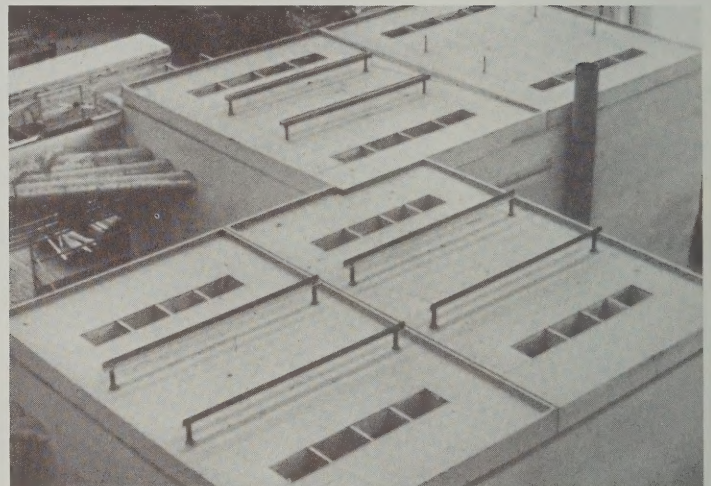
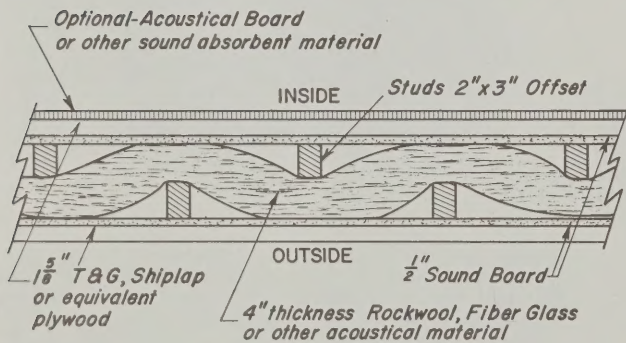
Typical massive door and wall treatment; in this case plywood of minimum thickness is used as the sheathing material. The importance of "mass" in containing planer noise cannot be overstressed.





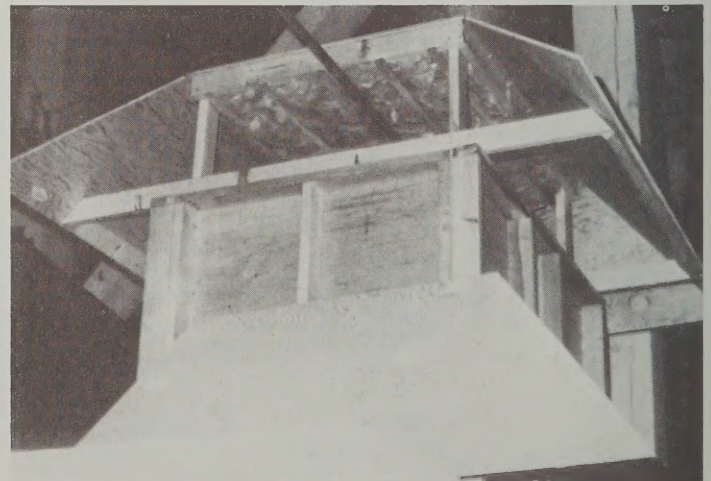
Close-up of outfeed conveyor tunnel. Note almost complete sealing of both outfeed opening (upper portion of picture) and opening for return run of belt.

Typical wall section of planer enclosure.



Looking down from the overhead bridge crane at two excellent enclosures. The metal rails are fittings which permit the roof sections to be lifted off by the crane. Make-up air openings were later baffled.

Air intake opening or chimney under construction showing acoustical treatment, sprinkler pipe, and weather cap.



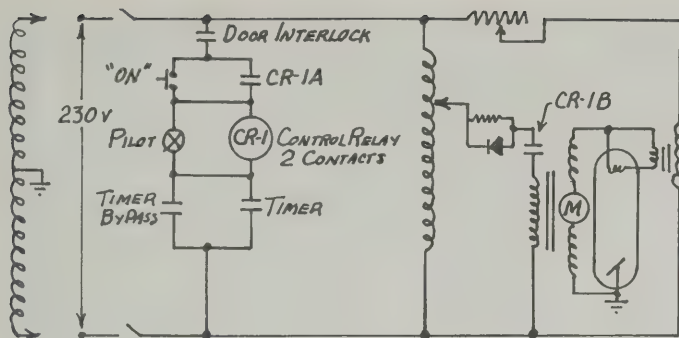


Figure 1

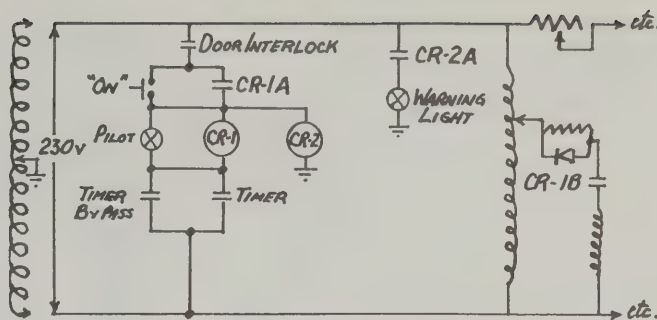







Figure 2

Safety Circuits

Design for radiation machines

William W. Steffan, Senior Health Physicist,
Environmental Engineering Unit, State
Division of Industrial Safety

There have been many serious accelerator and X-ray machine accidents during the past several years.¹ They appear to be increasingly more frequent and more severe. To clarify how such accidents occur, we have analyzed in detail circuits similar to those involved, but we have eliminated or simplified much circuitry not considered pertinent.

In our analysis we use the following symbols: **CR-1** means control relay number 1. When current flows through it, the relay switches **CR-1A**, **CR-1B**, etc., close. Switches shown, thus , are normally open; , normally closed; , push button, normally open; and , push button, normally closed. The symbol  designates a warning or pilot light.

In studying a number of accidents, we found one was caused by improper modification of a circuit when warning lights were installed near the tube head. This was done so that the warning lights would be on only when high voltage was applied to the X-ray tube.

The original circuit is shown in Fig. 1. It was modified by placing a second control relay (CR-2) in the circuit as shown in Fig. 2. CR-2 was a 115-volt relay while CR-1 was a 230-volt relay which had much higher impedance. On the morning of the accident the radiographer turned on the machine by closing the doors, switching the manual timer bypass, and depressing the "on" button. He then left to get some castings and brought them into the exposure room through an outside, interlocked door. The warning light went out when he opened the door to enter, and he assumed that the X-ray machine turned off. He set up the first shot under the X-ray machine and left to pick up his film badge in the front office before starting radiography. The first radiographic film was badly overexposed. Another radi-

ographer and co-worker mentioned later that sometimes the holding coil would hang up when the door was

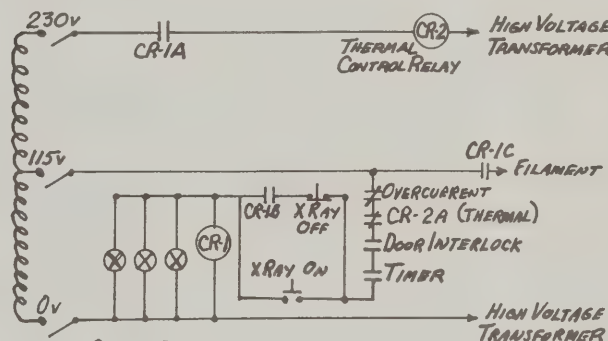


Figure 3

opened. The radiographer received an X-ray overexposure.

You will note in Figure 2 that there is a circuit from the lower main line through the timer bypass, CR-1 and CR-2 to ground (hopefully a neutral conductor). The voltage drop across CR-1 was sufficient to keep it closed, but the drop across CR-2 was insufficient, and it opened.

How should the circuit have been modified? One way would remove CR-2 and replace CR-1 with a three-contact control relay so that switch CR-2A would become CR-1C. Of course, safety circuits should not be used as operating controls but rather as a back-up mechanism in case the operating control fails.

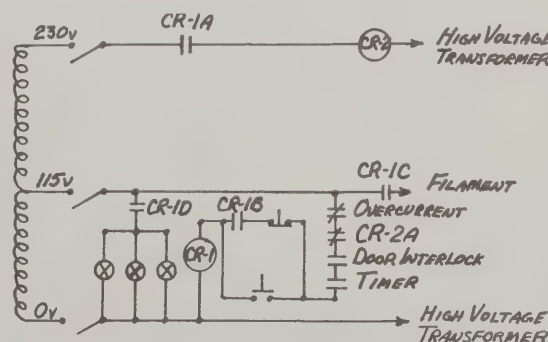


Figure 4

¹ Documents which also note and substantiate incidence and severity of such accidents are: William M. Brobeck et al, "Particle Accelerator Safety Manual," October, 1968; U. S. Department of Health, Education, and Welfare, Environmental Control Administration, National Center for Radiological Health, Rockville, Maryland; and the second, "Proceedings of the USAEC First Symposium on Accelerator Radiation Dosimetry and Experience" held at Brookhaven National Laboratory, Upton, New York, November 3-5, 1965; sponsored by the Division of Operational Safety, Division of Research, and Division of Biology and Medicine, U. S. Atomic Energy Commission, Washington, D.C.

Another accident with radiation equipment involved sticking switches caused by arcing when operated under a heavy inductive load.

A typical X-ray circuit design is shown in Fig. 3. This circuit has one serious disadvantage. Note that if either the timer, safety interlock, thermal protection, or fuse opens during operation, the warning lights go off; however, if the ganged switch CR-1A, CR-1B, and CR-1C sticks closed for any reason, the warning lights remain off, but the X-ray machine stays on.

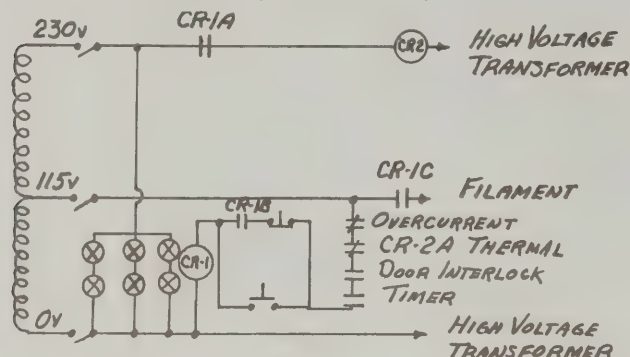


Figure 5

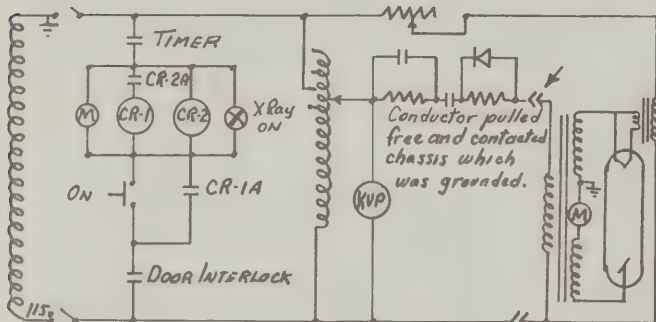


Figure 6

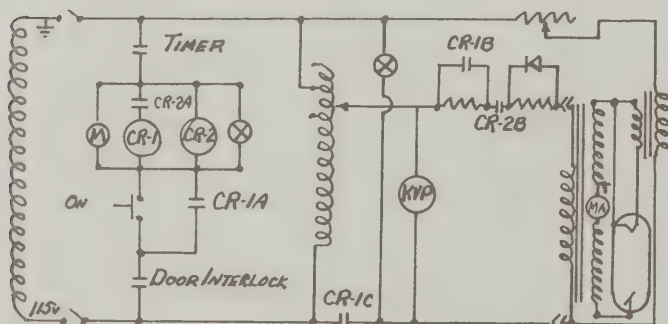


Figure 7

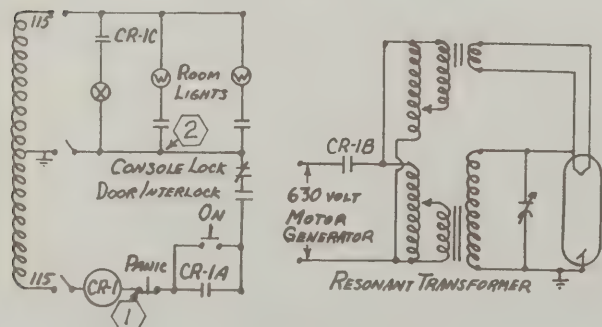


Figure 8

To take optimum advantage of the warning lights, the circuit should be modified as shown in Fig. 4.

If control relay CR-1 sticks shut, switch CR-1D will keep the warning lights on. An even safer arrangement is shown in Fig. 5. Here, the warning lights are placed in series groups. If the light inside the exposure room burns out, the warning light outside the door also goes out, indicating something is wrong.

Fig. 6 shows a circuit from an accident, described by the AEC in *SERIOUS ACCIDENTS—August 1965*, in which two men were overexposed when a pin connector pulled loose completing the circuit through the high voltage transformer primary to ground. The result was X-ray production bypassing all safety interlocks but with no warning to the men.

Obviously, with the door interlock open, the warning lights are removed from the circuit while the primary of the X-ray transformer may or may not be activated, depending on whether all relay switches open properly or whether the stray grounds are avoided.

An effective way to assure that warning lights are on only when the machine is producing X-rays is to install the lights across the primary of the X-ray transformer. The use of a second relay switch on the "hot" lead would also reduce the possible stray leakage-to-ground problem. The modification shown in Fig. 7 would have prevented the accident, but, more important, it would warn of almost any other accidental application of voltage across the primary of the X-ray transformer.

Another accident, fortunately not causing an overexposure but with the potential for one, involved a "panic" button and light switch located near the electron beam output of a 1-Mev resonant transformer accelerator. The radiation had damaged the switches beyond repair, and they had been removed by cutting the four conductors and leaving them in the box. A few days later when the accelerator was to be operated again, it would not start because the panic button circuit was open. So the accelerator maintenance man entered the exposure room to make up the panic button circuit. The motor generator was running, but the accelerator was locked off at the console. The interlocked door was open. The maintenance man was testing the circuit by touching the ends of paired wires to try to energize the light (the other two wires would then be the panic button circuit). Then he heard the main relay close, thus turning on the accelerator. Without undue delay he separated the wires and left the exposure room. (Fig. 8)

In Fig. 8, if Point 1 (one of the panic circuit wires) is connected to Point 2 (the neutral return from the light circuit), then control relay CR-1 is closed, thus closing switches CR-1A, CR-1B, and CR-1C and also turning on the warning light and activating the accelerator. Relay CR-1 is particularly vulnerable to stray grounding, doubly dangerous when wiring is exposed to very high radiation exposures. This circuit has been modified, locking out the motor-generator power supply at the console instead of using another series switch in the safety circuit.

These accidents point up the need to examine wiring diagrams of hazardous equipment, particularly when circuits are modified. The circuit changes must also be made on the wiring diagram. A safety analysis of such changes is necessary before the equipment goes into service as well as an initial safety check. Periodical checks after equipment is operational cannot be overemphasized.



Leaders at the opening session of the 1969 GISC were (left to right): Jack F. Hatton, Chief of the Division of Industrial Safety; Einar O. Mohn, Director of the Western Conference of Teamsters; Jerome W. Hull, President of Pacific Telephone; and Albert C. Beeson, Director of the Department of Industrial Relations, and chairman of the conference.

1969 Governor's Conference

Direction and impetus for the safety movement

Delegates to the 1969 Governor's Industrial Safety Conference heard praise for their efforts over nearly two decades devoted to eliminating hazards in California work places.

Governor Ronald Reagan summed up that praise in terming the conference "a valuable mechanism to help give direction and impetus" to the safety movement in



Jack F. Hatton, Chief of DIS (right), took time out during the conference to present Leo R. Westwater, Vice President of Granite Construction, Watsonville, with a special citation.

California. The Governor addressed the closing luncheon for the two-day conference at the Ambassador Hotel in Los Angeles, February 6 and 7.

At the opening session of the nineteenth GISC conference, chairman Albert C. Beeson, Director of the State Department of Industrial Relations, welcomed delegates and praised the results their industrial safety efforts have created. The 1,235 leaders from industry, labor, and government have established a record to be proud of, Beeson said. In the previous decade, they learned, the job injury rate had declined. At the same time, lost-time injuries rose but at a lesser rate than the rise in number of workers covered by California Workmen's Compensation.

Jack Hatton, Chief of the State Division of Industrial Safety, singled out for praise the regional meetings of the GISC held during 1968 as an effective means of educating and motivating management and labor to achieve greater safety participation.

The keynote speaker from industry, Jerome W. Hull, president of Pacific Telephone and Telegraph Company, praised the GISC and "such forums for the exchange of techniques and ideas."

"Annual meetings of this kind concentrate the skills of concerned individuals—in government, business, education, and labor—on a common urgent objective," Hull told the delegates. He underlined the urgency of such cooperation by comparing statistics for on-the-job injuries and fatalities with the figures for combat casualties in Viet Nam. The death tolls in U.S. industry and in battle are nearly the same, and disabling injuries

caused by industrial accidents are about 50 times higher than for all U.S. military personnel stationed around the world, according to Hull.

"There is no question about it. The best efforts of dedicated people all over America are needed to improve our national safety record," he said. His own company's militant attitude toward safety has had long-term benefits, summed up in his phrase, "a sense of safety".

"Experience proves that following prescribed safety procedures saves time and money in the long run. It improves production, not the reverse. Service, quality, and production objectives are not only attainable within the framework of acceptable safety standards, they are actually easier to reach," Hull said.

In conclusion, he referred to the heart of the problem in efforts to improve safety—the individual and efforts to impress that individual with the vital importance of safety. "The only lasting answer to our safety problems is to prod the indifferent attitudes into alert awareness of individual involvement—instilling that sense of safety."

The keynote speaker representing labor, Einar O. Mohn, Director of the Western Conference of Teamsters, also stressed the concept that safety is a way of thinking and can be achieved best by influencing the attitudes of individuals.

Communicating the safety message to the individual is the most important factor in advancing industrial safety, Mohn emphasized. He also cited other contributing factors that can defeat safety programs—new technical processes in industry, for example, the monotony of some jobs, and noise on the job.

To cut down the accident rate, he said, old and new employees must be educated to safety. Secondly, he called for efficient procedures for investigating accidents. Mohn stated that stricter safety regulations are needed for all states.

Emphasizing safety as a way of thinking and as an individual attitude, according to Mohn, can make strict safety regulations and rigid enforcement of those regulations the effective tools to provide the safest possible place for California workers.

Governor Reagan, in his address that closed the conference, praised the humanitarian efforts to achieve higher industrial safety standards. But everyone concerned with safety must work harder, he said, for good and compelling reasons. "One is the fact that each measure of improved safety performance tends to be more difficult to achieve than the previous one. The law of diminishing returns goes to work unless efforts are constantly improved and intensified," the Governor stated.

Although there is no basis for complacency, he described the past record as good. "In 1967, California industry set a new record of accomplishment in industrial safety. One out of every 1,000 workers, 970 of them, went through the year without a disabling accident. Estimates for 1968 show injury rates up slightly from 1967 although the 1968 rate is apparently the second best in the state's history," the Governor reported.

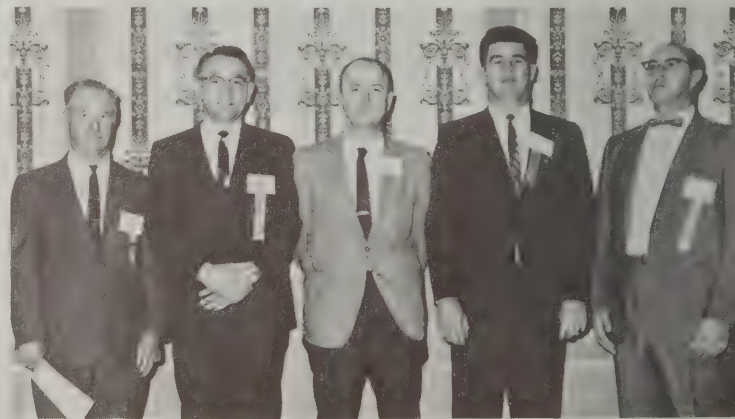
The bigness of California industry and its steadily growing work force are factors affecting the industrial injury rates; consequently, the Governor called for extra effort to keep the trends for 1969 going down. "We can accept some ups and downs along the way



Agriculture: R. H. Comstock, Speaker; William S. Walker, Speaker; Primo Orosco, Miles W. Kratka, Cochairman; Cliff H. Jameson, Cochairman; John O. Barnes, DIS Conference Consultant; Willard L. Pippitt, DIS Conference Consultant; Kenneth L. Howell, Speaker. (Cochairmen not shown: John A. Lewis; Frank E. Thompson)



Construction: Arthur T. Eisele, Cochairman; W. C. Willis, Committee Member; Willis Pugh, DIS Conference Consultant; Robert Jinkens, DIS Conference Consultant; Leo R. Westwater, Cochairman; E. J. Gale, Cochairman. (Herbert C. Ball, Cochairman, not shown)



Governmental Agencies: Robert S. Ford, DIS Conference Consultant; J. D. Jefcoat, Cochairman; Donald Rice, Cochairman; Dan Hungerford, Cochairman; Duane W. Hendrickson, DIS Conference Consultant. (Jim Slatton, Cochairman, not shown)



Members of the California Industrial Safety Board joined Jack F. Hatton, Chief of DIS (seated left) for this photo. Shown (standing left to right) are: Richard K. Humphries; Virgil L. Collins; Albert W. Turner; and Anthony G. Guerrero. Board Chairman Albert C. Beeson, Director of the Department of Industrial Relations, is seated right.

as long as permanent gains are established in the long run," he said.

In working toward the goals of safety for California workers, the Governor said that government can do "just so much. It can represent your wishes, but it cannot be a substitute for citizen action, follow-through, and determination. California's enterprisers daily demonstrate their ability to solve the complex problems which confront them. In the final analysis, the solution to these problems rests largely in their hands. Government can establish guidelines and provide stimulation, and labor can cooperate, and when all the forces jell together, we can be assured that our injury trend will be forced downward," he concluded.

Trades and Services: Harold K. Goddard, DIS Conference Consultant; Thomas L. Macnair, Cochairman; Bertha Metro, Cochairman; Emlyn L. Cox, DIS Conference Consultant. (Cochairmen not shown: Lester J. Coombes; Thomas Garrett.)



Manufacturing: Walter Kohn, Speaker; Henry A. Hartmann, DIS Conference Consultant; Chester McCloskey, Cochairman; Merritt Merrill, Cochairman; John Chocholak, DIS Conference Consultant. (Cochairmen not shown: Al Arismendi, Ralph McConnell.)



Mineral Industries: Larry L. McCune, DIS Conference Consultant; Merrill Brown, Acting Cochairman; Dale Marr, Cochairman; Silas L. Yount, Cochairman; Robert D. Baily, DIS Conference Consultant. (Cochairmen not shown: Andrew C. Christensen, Jack L. Gordon).



Transportation, Communications, Utilities: Carl E. Pulliam, Cochairman; Haril Whetsell, DIS Conference Consultant; Nate DiBiasi, Cochairman; Ronald T. Weakley, Cochairman; H. M. Clement, Cochairman; Andrew T. Brozik, DIS Conference Consultant.

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The State Division of Industrial Safety distributes without cost a number of bulletins, placards and article reprints relating to rules and procedures for improving safety in the workplace. Requests for titles of publications available (Bulletin S-145) should be addressed to Research and Education Section, State Division of Industrial Safety, P. O. Box 603, San Francisco, California 94101.

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CALIFORNIA SAFETY NEWS

WHERE THE ACTION WILL BE

Ambassador Hotel, 3400 Wilshire Boulevard, Los Angeles
Site of Governor's Industrial Safety Conference, February 6-7, 1969



Theme for the Conference will be "Safety Through Education"

(See pages 8-9)

Published quarterly by the

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Governor's Industrial Safety Conference Scheduled

Los Angeles will be the site for the next annual two-day meeting of the Governor's Industrial Safety Conference on February 6-7, 1969.

The Conference has been of great importance over the years in lowering the work injury rate in California. It is devoted to the single but important subject of on-the-job safety.

The dynamic growth of California, with its continuing expansion of the industrial population, makes it mandatory that the injury rate be decreased; if not, greater and greater numbers of our workmen will be injured or killed.

Enforcement of the provisions of the *State Labor Code* requiring employers to provide a safe place of employment is basic but it cannot be thoroughly effective unless there is complete cooperation of all employees. This requires knowledge of hazards inherent in industry and how to correct them.

The theme for the Conference will be "Safety Through Education." It is our earnest desire that information



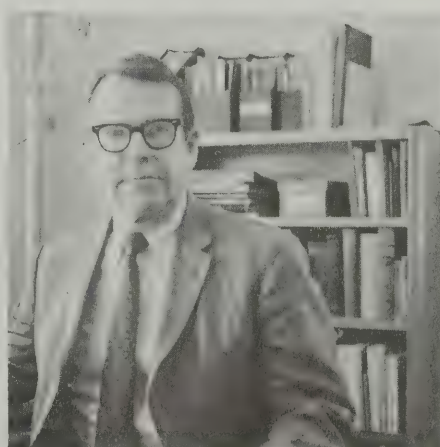
**Albert C. Beeson, Director,
Department of Industrial Relations**

gained during attendance will be of assistance in improving the safety programs throughout the State.

It is because of my deep concern for the safety of all workmen, and my conviction that profits—not losses—result from the avoidance of accidents and injuries that I call on leaders of management and labor and all other individuals and organizations concerned with on-the-job safety in this State to attend this Conference.

Albert C. Beeson

**J. Robert Signer
Appointed Supervising Engineer
Research and Education Section**



Cover photo courtesy Ambassador Hotel.

The Personnel Board recently approved the appointment of J. Robert Signer as Supervising Engineer, and changing the name of the Education Section to Research and Education Section, reflecting increased responsibilities of the Section.

Signer has been with the Division of Industrial Safety for 15 years.

IF YOU MOVE . . .

and wish to continue receiving the CSN, please send us your new address. Post offices are instructed not to forward copies.

The California Safety News is mailed free of charge to those interested in industrial safety.

12,500 copies of this issue were printed.

Northern California Lumber Industry Leads Way in Noise Control

A 2" x 12" dry Ponderosa pine board moves through the modern high speed planer at a rate of 500 or more feet per minute. Four cutting heads rotating at 3600 revolutions per minute strip the rough outer layer, leaving a smooth surface on all four sides. As the board leaves the cutting heads, a circular rip saw neatly cuts it in half lengthwise.

This highly efficient operation produces thousands of board feet of finished 2" x 6" lumber every hour. But—it also produces a nerve-shattering noise that averages around 115 decibels and at times goes as high as 124 decibels. At the feeder's work station the noise level ranges from 102 to 108 decibels. The grader men and cut-off saw operator are exposed to noise levels up to 103 decibels. Usually all workers in the mill building, sometimes as many as 50 in number, are exposed to levels of 95 decibels or higher. These are high production mills, so the noise is continuous all day long.

The California Noise Control Safety Orders call for noise reduction methods to be instituted if the noise level equals or exceeds 95 decibels in any one octave band for 5 hours or more per normal working day. For shorter periods, the allowable level can be raised somewhat but with planer noise there is no combination that would make these conditions safe.

For years most planing mill operators depended on available ear plugs and muffs to protect their workers from this hazard. Some two years ago Division engineers and mill operators in Shasta, Siskiyou, Modoc and Trinity Counties decided that this was not good enough. Working together, they developed a program for controlling planer noise by building soundproof enclosures around the planers.

Drawing on the experience of pioneers in the construction of enclosures, such as Fruit Growers Supply at Hilt, U.S. Plywood at Anderson and Heron Mills at Central Valley, and applying basic principles of acoustical engineering, design criteria were developed.



Double planer enclosure. Note outfeed tunnels, make-up air intake openings on roof. Standard size door indicates size of overall structure.

The basic construction material was to be wood—the prime commodity of the industry. The more highly sophisticated acoustical materials used by the space industry were considered, but ruled out because of the cost factor.

One of the most important considerations in enclosure design was to keep the number of openings to the absolute minimum. Necessary openings were kept to the smallest size practical and equipped with doors, flexible closures or baffles to block the noise path.

Wall design called for an 8" to 10" wall using offset studs so the inside wall would be independent of the outside wall. The two walls would have separate sills and headers and these would have a layer of deadening felt separating them from the floor and ceiling. Adjoining walls which formed corners were also to be separated by a layer of deadening felt. Rockwool or fiberglass insulating material filled the space between the inner and outer walls. Sheathing was 1½" tongue and groove or equivalent plywood inside and out. A layer of deadening felt or insul-board was to be laid between studs and sheathing. An additional inside sheathing of acoustical board on the upper two-thirds of the walls and ceiling was recommended. This material is helpful in absorbing noise energy but does not stand up well under the punishment received by the lower walls inside the enclosure.

Roof construction was similar to walls, only not as elaborate. Removable wall or roof panels were provided to permit major repairs on the planer.

Walls or roof require openings for ducts and pipes. These were made just enough oversize to permit packing the annular space between the duct and the wall section with insulating material to block the noise path and reduce transmission of vibration to the structural members.

All planers are equipped with local exhaust ventilation to evacuate chips and wood dust. Some of these have a capacity of more than 10,000 cubic feet per minute. Provision had to be made for a make-up air opening that would contain the noise to a reasonable degree. One method recommended was to construct the opening as a chimney in the roof several feet high with baffles every foot or so partially blocking the opening. With the baffles alternating from opposite walls of the chimney, the incoming air would follow a zigzag path but the noise path would be effectively blocked. An alternate type of construction recommended was a smooth-walled chimney with a single baffle in the form of a "weather cap." The cap was to be lined on the side facing the noise source with acoustical material. In either case, care had to be taken to insure that total open area was adequate for blower capacity.

Floors in most planer areas are sufficiently heavy to provide an effective sound barrier. However, in cases where the planer was mounted on concrete piers above the ground floor level, it was necessary to provide sound barriers of construction similar to walls, in all openings between piers.

Refrigerator-type doors with beveled or stepped edges, top and sides, were called for. It was recommended that doors open out where possible so that suction from the blowers would automatically keep them closed. Weather stripping was to be installed along the lower edge of doors and gasketing on the door jambs to improve sealing. Since these doors are heavy, steel door frames and heavy duty hinges were provided.

(Continued on page 4)

Windows were to be kept to a minimum in number and as small as practical. Double panes of shatter-proof glass separated by an air space were prescribed.

One of the toughest problems encountered was providing a suitable closure for the infeed and outfeed openings. The only effective method developed was a tunnel-type opening. It provided room for multiple baffles of old conveyor belting or similar material to block the noise path. The belting was slit at intervals to accommodate widths of boards fed into the planer so the area of the opening would be kept to a minimum while operating. Where space permitted, the outfeed tunnel was to be at least as long as the longest boards fed through the planer. In this way the noise produced by the vibrating board as it passes through the planer is confined to the tunnel and the enclosure, rather than being transmitted directly to the general room atmosphere. A funnel-shaped metal facing was recommended to guide stock into the tunnel opening in order to prevent damage to the structure or hazard to the workers.

Of particular importance for the effectiveness of the enclosure is the quality of the workmanship in its

construction. Only a tight, well-constructed enclosure is an effective enclosure. Fortunately the mills participating in the program have some of the finest millwrights in the business. They are master craftsmen who take great pride in their work. Their skill and resourcefulness have contributed markedly to the success of the program.

Just how successful has the program been? Of the 35 planers in mills scattered throughout the four-county area, 30 are already enclosed or have enclosures under construction. Noise intensity in mills where enclosures have been completed to specifications has been reduced almost sixtyfold. The only worker now exposed to abnormally high noise levels is the set-up man who must enter the enclosure from time to time during the day to make adjustments on the planer. On these occasions he is protected with ear muffs or plugs.

In addition to reducing the hazard of noise-induced hearing loss, mill operators are enjoying fringe benefits in the form of increased efficiency and production, and improved employee and community relations.

This California industry is truly leading the way by proving the value of engineering control of excessive noise.

The 42nd Annual Conference of the California Certified Boiler and Elevator Inspectors Association Will Be Held at the Biltmore Hotel in Los Angeles on January 28, 29 and 30, 1969

The main sessions will be held in the Galeria Room. Educational displays and demonstrations will be exhibited in an adjoining room.

Mr. Albert C. Beeson, Director of the Department of Industrial Relations, will be one of the keynote speakers.

C. Weisman, Senior Safety Engineer in the Pressure Vessel Section, Los Angeles, is the General Chairman; he is in overall charge of program arrangements.

Mr. S. F. Harrison, Acting Executive Director of the National Board of Boiler and Pressure Vessel Inspectors, will address the meeting concerning new developments in pressure vessel inspection. Following the California Conference, he will attend similar meetings in Oregon and Washington.

Other speakers will be:

Mr. Donald O'Neil, Chief Inspector, Atlantic-Richfield, Products Division, Wilmington Refinery.

Mr. W. E. Sutton, Chief Elevator Inspector, Province of Alberta, Canada, Department of Labor.

Mr. Joseph Burley, President, Boston Insulated Wire and Cable Company, Boston, Massachusetts.

Mr. Charles W. Lerch, Professional Elevator Consulting Engineer, Denver, Colorado.

Tailgate Topics

A new series of brief safety articles entitled, "Tailgate Topics" is being distributed by Division Safety Engineers to employers. Their purpose is to assist employers in holding tailgate (or toolbox) safety meetings.

The first of the series, reprinted in the September issue of the CSN, was "Why Tailgate Safety" (TS-1-768). Additional articles published since, and available on request include:

"Your Hands" (TS-2-768)

"A Penny's Worth of Nails" (TS-3-868)

"Noise" (TS-4-968)

"Ladders—Friend or Foe?" (TS-5-1068)

"Electric Cords" (TS-6-1068)

"Respirators" (TS-7-1068)

"The Flicker-Switcher . . . May His Tribe Increase" (TS-8-1168)

"Who's Carrying the Tool Box?" (TS-9-1168)

Mr. D. Hollenberg from the County of Contra Costa, lecturing on "Tailgate Sessions" at the Governor's Industrial Safety Conference, Governmental Agencies, in Redwood City on October 10, pointed out ways to increase the effectiveness of these sessions. Briefly these were:

1. Don't lecture; it's deadening.
 2. Don't read materials to them (such as the "Tailgate Topics") because very little is retained in the minds of your men, when they're merely a passive audience.
 3. Involve your men personally by asking them questions. Get them talking on the subject. They will learn more and retain it longer.
 4. An easy and quick way is to draw a simple line sketch illustrating a safety problem, for example, and ask them "What's wrong? Where is the hazard? How would you correct it?"
 5. Ask your men to submit ideas for future meetings, along with line sketches to illustrate problems they'd like discussed. They will point out to you the hazards the men find on the job; you might even discover weaknesses in your safety program.
- It is in line with the idea of "questioning everything as you work" that we reprint TS-3-868 "A Penny's Worth of Nails" and may it make you more aware of the necessity of keeping alert your "safety sense."

"A Penny's Worth of Nails"

Not long ago a workman was given the job of covering some large holes in the floor of a wooden elevated work platform to prevent someone from falling through accidentally. He decided to place large sheets of plywood over the openings to do the job.

While placing a panel of plywood he failed to notice that one edge of the panel was just barely supported at the side of the opening. Later, he stepped on the edge of the panel. The panel slipped, tilted, and dropped him many feet below to his death.

One way to prevent this type of accident is to "tack-nail" each panel with a few nails to secure it properly in place, as it is placed. In this case two or three pennies worth of nails would have saved that man's life.

But, was it only the lack of a few cents worth of nails? Absolutely not! It was not only the lack of a few nails, but more important it was the lack of "safety sense" or a lack of simple "know-how" that killed the man.

In almost every job there are possibilities of injuries—even death. Take it upon yourself to question everything as you work. Size up each job, each machine, each tool you use, and apply your best "safety sense" to everything you do. Develop the habit of seeking and learning simple "know-hows" that might save your life or limb. Always ask, "Can I get hurt if I do the job this way?"

Forest Products Section GISC to Meet in Redding February 7, 1969

This year the Forest Products Section will hold their meeting in Redding, in lieu of meeting in Los Angeles. It will be a one-day session on February 7, 1969.

At this time it is not known where the meeting will take place, but this information will be disseminated shortly to those on the Forest Products mailing list.

This change is being tried for the 1969 Conference in order that the meeting can be held in the heart of the Forest Products industry of California. It is hoped this will lead to a large turnout of people from that area

Amusement Rides Safety Law Effective November 13, 1968

This law requires that amusement rides must have a permit issued annually before being used. Applications will be issued by the Division upon request; these should be addressed to 455 Golden Gate Avenue, San Francisco 94102.

In addition, a liability insurance policy in the amount of not less than \$50,000 or a bond or cash in like amount is required.

Carnival owners and owners of amusement rides that operate in California were invited to a meeting in San Francisco or to one in Los Angeles to discuss the provisions of the law, Assembly Bill No. 888. These meetings were held during October, 1968.

One Way Safety Pays

The text of a letter Wodruff-Sawyer & Co., Insurance Brokers, addressed to Le Fiell Company, 1469 Fairfax Avenue, San Francisco dated June 21, 1968 is quoted as one of many similar letters by the numerous insurance companies proving that safety pays:

"Enclosed is a check from Argonaut Insurance for \$1,775.90. This is your Workmen's Compensation dividend earned because of good loss experience from January 1, 1966 to January 1, 1967.

"You are to be congratulated on having an outstanding loss record. We hope to deliver many more of these checks to you in the future."

GISC to Discuss Hard Core Unemployed

This year's Los Angeles Conference will be of special interest and we hope informative to industries which are hiring the hard core unemployed. This is a major social problem in this country and its aspects will be discussed in several sections of the Conference.

who might find it impractical to go to Los Angeles. In 1970, however, the Forest Products Section will take its customary part in the Conference which will be held in San Francisco.

Most Costly Accident . . . \$1,750,000 Awarded One Man, \$170,000 Awarded His Brother

Personal injury suits, settled by compromise, awarded John H. Parke, a 48-year old ironworker \$750,000 general damages and \$1,000,000 in medical expenses. His 50-year old brother, William, was awarded \$170,000 in general damages.

Both men were injured in a single accident when a retractable platform collapsed when they walked onto it. John suffered brain injuries requiring medical attention for the remainder of his life. William was less seriously injured.

The accident occurred on November 1, 1966 while the men were working on a flight and guidance simulator for the National Aeronautics and Space Administration at the Ames Research Center, Moffett Field.

How Not to Run a Safety Meeting

The subject of a safety meeting was ACCIDENTS. The 5-minute safety talk, "Accidents are Caused," was read. Afterward a heated discussion arose.

During the lull, one member raised his hand to ask a question and accidentally knocked a coat off a rack which fell over the head of a second member. While removing the garment, the temporarily blinded member struck the window behind him with his elbow, scattering glass on the floor.

While picking up glass, two others received slight cuts, so the group leader got a push broom. In the crowded room, either the broom handle, or another member moving out of the way, dislodged a fire extinguisher which fell, spraying the group with chemicals.

The member who originally had raised his hand said he had forgotten what he was going to say and instead complained about the cold air coming in the broken window. Since there is no cure for the common cold, the meeting was adjourned.

From Safer Oregon

Another Method for the Control of PERCHLOROETHYLENE Vapors

By Walter Van Sandt, Industrial Hygiene Engineer, Division of Industrial Safety



The Division recently made an industrial hygiene survey of a shop that specialized in the machining of molybdenum alloys. The lubricant-coolant for the cutting tool was a special solution of oil in perchloroethylene.

Our study showed that the machinists were exposed to very high concentrations of perchloroethylene vapor. The shop conducted experiments on a number of other lubricant-coolant liquids. None was found to be satisfactory. The shop was faced with the problem of reducing the concentration of perchloroethylene vapor to acceptable limits by the most economical means.

For years, textbooks on industrial hygiene engineering have listed three principal methods for the control of occupational exposures:

(1) Substitution of less toxic materials, (2) isolation or enclosure of operation or machine, and (3) control at the point of generation or dissemination. The latter is usually done by local exhaust ventilation, use of wet methods, good housekeeping, or some combination of these.

It would have been very expensive to equip all machines in the shop with local exhaust ventilation. Substitution of less toxic materials was not satisfactory. Complete enclosure was not possible. One method to control the generation of toxic vapors, not given in any textbook, to my knowledge, is by reducing the temperature. Refrigeration equipment which reduced the temperature of the perchloroethylene solution to a few degrees above its freezing point was installed in the shop. The used lubricant was returned to the cooling unit through a closed system. Concentrations of perchloroethylene vapor fell to acceptable levels. This is an unusual application of a physical property of a liquid to solve an industrial hygiene problem.

Report from a Square Safety Engineer

Even though I don't possess the qualifications apparently necessary to be a guest lecturer these days, such as being a leader of a minority militant group, an ex-con, a user of vile profanity and 4-letter words, a shaggy mane, etc., I nevertheless was a guest lecturer today at a Supervisory Safety Training Course being given by the State Compensation Insurance Fund to a group of about 25 first and second-level supervisory personnel of the county.

My topic was "Job Safety Analysis" and not even once did I challenge the Governor to a duel.

Widow Awarded \$7,500

Charles Dennis Watson was killed using a tractor not equipped with a protective canopy required by *Construction Safety Order 1595 b*; he died February 28, 1967.

In a case heard by the Division of Industrial Accidents, Barney Theole, dba Associated Sales and Service, was charged with serious and willful misconduct.

Betty Watson, widow and guardian of Watson's two minor children was awarded \$7,500.

William A. Parson was referee in the case.

Californians have been leading the Nation in the development and use of cryogenic fluids over the past 13 years. Cryogenics is the science of ultra low temperatures, or low temperature technology.

The Division of Industrial Safety takes pride in the fact that these new techniques have been used with an excellent safety record; very few workmen have been injured as a result of accidents while handling cryogenic fluids.

Articles 459 and 467 of the *Unfired Pressure Vessel Safety Orders* provide for the proper design and construction of vessels as well as for the installation of safety valves or rupture discs to provide safe containers for these fluids.

Since the use of cryogenic fluids is increasing very rapidly, particularly in institutions such as hospitals, the purpose of this article is to alert users and potential handlers of these materials to hazards inherent in their use and to explain safe handling techniques.

Oxygen, hydrogen, nitrogen, helium, as well as other gases, become liquid under different conditions of pressure and temperature. These liquids have boiling points of -250°F . or below, and so are commonly used as cryogenic fluids, normally being handled in fluid form. The properties of each differ from the others. However, all cryogenic fluids have two important properties in common. They are extremely cold and will freeze living tissue instantly; and a very small amount of liquid will convert into a very large amount of gas. As an example, one cubic foot of hydrogen in liquid form will convert to 848 cubic feet of gas at atmospheric pressure.

Avoid Contact

If fire, explosion and personal injuries are to be avoided, extreme care must be exercised at all times while handling or working with cryogenic fluids. Protective clothing such as plastic-coated aprons or coats, full face shields and loose asbestos gloves should be worn while handling them. A splash or spill of liquid on the skin causes an injury similar to a burn. The gases issuing from the liquid are extremely cold and can damage delicate eye tissue by a very brief exposure, much shorter than necessary to damage skin.

CRYOGENIC FLUIDS

Division of Industrial Safety

on the hands or face. Any contact with the liquid or gas is hazardous.

If any of the liquids or gases contact the skin or eyes, immediately flood that area of the body with large quantities of unheated water. Provide deluge-type showers in areas where cryogenic fluids are used, handled or stored to enable persons to immediately wash off spills or splashes. If blisters appear or the eyes are affected get the patient to a physician at once.

Ventilation

Be certain that the area in which fluids are handled is well ventilated. High concentrations of oxygen and hydrogen are a fire and explosion hazard. Excessive concentrations of the other gases reduce the amount of oxygen in the air and may cause asphyxiation. The gases, being colorless, tasteless and odorless, cannot be detected by the human senses and will be inhaled as if they were air. The cloudy vapor that appears when the gas is exposed to the air is condensed moisture and not the gas itself. Issuing gas is invisible. There is usually some gas above the cloud of condensed moisture.

Use Only Approved Containers

Containers made for holding cryogenic fluids are constructed in accordance with the ASME Code or ICC (now known as Department of Transportation, DOT) Regulations from materials which can withstand the thermal shock of sudden, rapid cooling. Even these should be filled slowly to minimize the shock. All containers must be open or equipped with a vent or relief valve which will prevent build-up of pressure due to conversion of the liquid to a gaseous state within the container. Check the relief valve frequently to be sure it is not plugged with ice from water vapor condensation.

Do not improvise stoppers. Use only the stopper supplied with the container.

Access to Storage Unit Areas

Access to areas where liquefied gases are stored or used should be restricted to authorized personnel. Smoking and other sources of ignition should not be allowed within 200 feet of storage areas or locations where liquids are used and workmen should not carry matches or cigarette lighters.

Liquefied Oxygen and Hydrogen

Both oxygen and hydrogen present a severe fire hazard in either liquefied or gaseous form. Extra precautions must be observed in handling or using them. In addition to the general precautions mentioned above, the following must be put into effect and enforced if serious accidents and injury are to be avoided:

Liquefied Oxygen (LO₂)

(1) Never permit organic or flammable substances or materials to come into contact with liquid oxygen. Under certain conditions of pressure and temperature, oil, grease, tar, wood, paper and cloth, as well as other organic materials, can react violently when combined with oxygen. Contamination of any kind must be avoided. Since oxygen itself does not burn, there can be no fire unless combustible material is also present. In any fire involving LO₂ the oxygen plays the same part as oxygen from the air in an ordinary fire. However, the presence of additional oxygen will make any fire burn faster and more violently.

(2) Under proper conditions finely divided particles of the above materials, when exposed to liquefied oxygen, may detonate from even a slight shock. When organic materials such as those mentioned above are exposed to liquefied oxygen, they will burn violently when ignited, even several minutes after they have been in contact with the liquid.

(3) Clothing that has been splashed with LO₂ should be removed and aired away from sources of ignition for at least an hour before being worn. Persons working with LO₂, or in any oxygen-rich atmosphere, should be alerted to the fact that oxygen will permeate the fibers of their clothing and penetrate the areas between clothing and body. They could become human torches if they subject themselves to a source of ignition, such as by lighting a cigarette before the oxygen has aired from their clothing.

(4) Never use oil or grease on oxygen valves, gauges or lines. Lubricate equipment only as recommended by the manufacturer.

You may reprint any of our safety publications, giving a credit line to the Division of Industrial Safety, State of California. Please send us a copy of the reprint.

Liquid Hydrogen (LH₂)

Basically, the same precautions apply to the storage and handling of liquefied hydrogen as are necessary with liquefied oxygen. However, both liquefied and gaseous hydrogen present an extreme explosion and fire potential. Special care must be taken to keep all fire, sparks and ignition sources distant from areas where LH₂ is used, stored or handled. All electrical equipment, wiring and switches must be of approved explosion-proof type. Non-sparking tools of bronze or other non-sparking material should be used exclusively.

Do's and Don'ts

The following are a few simple, basic Do's and Don'ts that, if followed, will make storage, use and handling of cryogenic fluids a safe operation:

DO

1. Ventilate all areas where cryogenic liquids or gases are handled.
2. Keep ignition sources away—no smoking.
3. Wear eye, face, body and hand protection at all times.
4. Wear loose fitting gloves of asbestos or leather.
5. Electrically ground all equipment.
6. Insulate all liquid lines.
7. Remove all excess oxygen from clothing before smoking.
8. Avoid contamination of all lines and containers.
9. Identify all equipment and use only for purposes intended.
10. Open or close oxygen valves slowly.

DON'T

1. Mix hydrogen and oxygen.
2. Trap cryogenic liquids between valves.
3. Vent cryogenic vessels into un-vented rooms.
4. Store cryogenic liquids in glass containers.
5. Mix oil, grease, or other organic materials with LO₂.

The California Safety News is interested in obtaining usable safety information, together with pertinent black-and-white glossy photographs. If you have an idea for safety, a safety record or a safety procedure that you believe may be of value to others, please send it in. The California Safety News does not pay for material, but may give it worldwide distribution.

Governor's Industrial Safety Conference

Los Angeles, February 6-7

The 19th annual statewide meeting of the Governor's Industrial Safety Conference will be held on Thursday and Friday, February 6th and 7th, 1969, at the Ambassador Hotel, Los Angeles.

Registration will begin at 7:30 a.m. on Thursday, February 6th. Judging from attendance figures in recent years, some 1500 persons will be present for the two day meeting.

Albert C. Beeson, Director of the Department of Industrial Relations and general chairman of the Conference, will call the general assembly to order at 10 a.m.

Jack F. Hatton, Chief of the Division of Industrial Safety and secretary of the Conference, will follow with announcements and general remarks.

The principal speakers at the general assembly will be Jerome W. Hull, President of the Pacific Telephone and Telegraph Company, and Einar O. Mohn, Director of the Western Conference of Teamsters.

Section Programs

The various sections or major industry groupings that compose the Conference will hold separate section meetings on the afternoon of the 6th and morning of the 7th. The timely and interesting topics that will be discussed appear at the right. Industrial safety films will be shown four times during the Conference. These will be brand new releases, offered through the courtesy of the Greater Los Angeles Chapter of the National Safety Council.

Governor's Luncheon

The highlight of the final day will be an address by the Honorable Ronald Reagan, Governor of California, at a luncheon meeting at 12 noon, February 7th.

Tickets for the luncheon, to be held in the Embassy Ballroom, are \$6.00

each, including tax and tip. They may be obtained by writing to GISC Headquarters, Room 7224B, 455 Golden Gate Avenue, San Francisco 94102, and enclosing a check or money order made out to "GISC Luncheon." After January 24, tickets will not be mailed out, but held for you at the "will-call" desk at the conference.

Reserved tables for specific groups will be arranged only for groups of 10 persons (or multiples of 10), accompanied by a remittance for the exact amount.

Hotel Reservations

The Ambassador Hotel has reserved a block of rooms for persons attending the Conference. Those planning to stay at this hotel are advised to make reservations directly with the hotel, without delay, stating they will be attending the Conference.

Special Message Center

Through courtesy of the Pacific Telephone and Telegraph Company a message center booth will be provided for the convenience of the delegates. Attendants will be on duty from 8:30 a.m. to 5 p.m. on February 6 and from 8:30 a.m. to 2:30 p.m. on February 7. They will post the names of those receiving messages and provide change for nearby coin telephones. The message center booth number will be (area code 213) 381-2191.

Inquiries regarding the Conference may be made to Division of Industrial Safety (southern California):

Mr. McKay Mitchell
230 East Fourth Street
Long Beach, California 90812
Phone (213) 432-8443

For northern California:

Mr. J. Robert Signer
455 Golden Gate Avenue,
Room 7224
San Francisco, California 94102
Phone (415) 557-2327

AGRICULTURE SECTION

Thursday, February 6—1:30 p.m.

PLEASE LOOK AT OUR VISUAL AIDS BEFORE AND AFTER MEETINGS

Youth in Agriculture

How to Employ a Minor

William S. Walker, Deputy-in-Charge, Division of Law Enforcement, Bakersfield

The Narcotics Question

Gary Shoemaker, Area Supervisor
Primo Orosco, Senior Narcotics Agent, Bureau of Narcotics Enforcement, Los Angeles

Tailgate Safety Meetings—Demonstrations of T

Miles W. Kratka, Executive Secretary, San Diego Farm Bureau, Escondido

Here's How to Look at Our Visual Aids—(By the people who made them.)

Kenneth L. Howell, Educator and Farmer, Wildomar

Friday, February 7—9:00 a.m.

The Psychology of Safety

Viktor Christensen, Head, Department of Curriculum Instruction, Loma Linda University, Riverdale

After the Accident

Reporting of Employee Injury

William McKee, Head Claims Manager, Lloyds Insurance Companies, Los Angeles

What Happens When Application Is Filed

Ken Kendig, Attorney, Weingand, Kendig & Associates, Los Angeles

A Farmer Looks at Safe Production

Norman Liddell, Owner-Manager, Liddell & Sons, Fresno

CONSTRUCTION SECTION

Thursday, February 6—1:30 p.m.

How Are We Doing in Our Efforts to Have a Safe Worker in a Safe Place of Employment?

James S. Lee, President, AFL-CIO Building & Construction Trades Council

Requirements on Accident Prevention Program,

Vincent L. White, Assistant to the Chief, Division of Industrial Safety

The Relationship Between Accident Cost and Employee Safety

Sid Kelly, Safety Director, Paramount Pacific, Los Angeles

Ceco Corporation's Accident Prevention Program

William Norton, Vice President, Ceco Corporation

Job Supervisory Actions in Providing Effective Accident Prevention Program on the Job Site

Lloyd MacDonald, Superintendent, Kaplan Construction Company

Friday, February 7—9:00 a.m.

History and Basis of Grants Including Serious Misconduct

Patrick R. Maloney, Referee, Industrial Accidents, Los Angeles

Substructure Explosions and Atmospheric Test Structures

Howard Eriksen, Pacific Telephone and Telegraph, Los Angeles

Blue Energy and Confined Spaces

E. B. Girdler, Southern California Gas Company, Los Angeles

Special Construction Study of 791 Typical Accidents (Speaker to be announced), Division of Industrial Safety

Presentation of Committee Recommendations

EDUCATION AND RESEARCH SECTION

Thursday, February 6

7:45 a.m.—Showing of safety films—the latest in the field of industrial safety. Films supplied through the courtesy of the National Safety Council

Outline of Section Programs at Forthcoming GISC

tesy of the Greater Los Angeles Chapter, National Safety Council.

Noon—Same as above

4 p.m.—Same as above

Friday, February 7

7:45 a.m.—Same as above

GOVERNMENTAL AGENCIES SECTION

Thursday, February 6—1:30 p.m.

The Role of Cardio-Vascular Physical Fitness in the Reduction of Compensation and Health Insurance Costs—a panel presentation

Moderator: Don Rice, Safety Officer, City of Long Beach
Dr. Richard Steiner, Chief of Pathology, Long Beach Community Hospital

Professor Haskel Elder, Physical Education, Long Beach Unified School District

Dr. Raymond Thornton, University of California, Los Angeles

Friday, February 7—9 a.m.

The Development of Communication Techniques Between First Line Supervisors and Employees as an Accident Prevention Tool

Moderator: Jerry Costa, Safety Coordinator, Los Angeles County

William Guthrie, Assistant Department Head for Business Administration, University of California, Los Angeles

MANUFACTURING SECTION

Thursday, February 6—1:30 p.m.

Special Problems of Educating the Hard Core Unemployed

Robert J. Wayne, Director of Safety, Kaiser Steel Corporation

Safety Education—the Broad Aspects—panel discussion

Moderator: Joseph Wymer, Professor of Industrial Engineering, California State Polytechnic College

How Schools and Colleges Can Prepare Students to Work Safely in Industry

Professor Joseph Wymer

Responsibility of Supervisors and Foremen to Educate Their Men to Work Safely

Roy Bell, Administrative Director, Division of Industrial Accidents

Management's Responsibility for Promoting Safety on the Job

Karl R. Kunze, Manager of Training and Personnel, Lockheed California Company

Friday, February 7—9:00 a.m.

Practical Noise Abatement

Walter Kohn, Industrial Hygiene Section, General Motors Corporation

Psychological Rehabilitation of the Injured Worker

Dr. Thomas J. Meyers, Ph.D. Psychiatry and Neurology, Pasadena

MINERAL INDUSTRIES SECTION

Thursday, February 6—1:30 p.m.

Work Injuries Statistics—and Report on Merger of Mineral Industries Section

E. A. Brubaker, Supervising Engineer, Division of Industrial Safety

Designing Safety into an Underground Mine and Surface Quarry

Harry Conger, Assistant Manager, Kaiser Steel Corporation, Eagle Mountain

Summary of Recommendations Regarding Transit Mix Truck Hazards

Jack Cedarblade, Executive Secretary, Northern California Ready Mixed Concrete and Materials Association

Don Reining, Executive Secretary, Southern California Rock Products Association

Friday, February 7—9:00 a.m.

Petroleum Drilling Safety

Jack Skeeahan, Manager California Area, American Association Oilwell Drilling Contractors

Electrical Safety

R. E. Dunn, Utility Supervisor, Shell Development Company

TRADES AND SERVICES SECTION

Thursday, February 6—1:30 p.m.

Safety Problems in Trades and Services Are All Basically the Same—The Bakery Industry Has the Answers—a panel presentation

Moderator: William D. Regan, Regional Personnel Manager, Interstate Bakeries Corporation

Effective Indoctrination and Training Procedures Deter Accidents

Newton West, Personnel Director, Helms Bakeries

The Manager—First or Last Link in Accident Prevention Chain?

Robert E. Zink, Plant Manager, Weber Baking Company

Productive Safety Meetings—Are Yours Productive? Here Is Help!

Robert T. Chamberlin, Assistant Engineering Manager, Industrial Indemnity Company

Poor Planning Versus Proper Planning

William D. Regan, Regional Personnel Manager, Interstate Bakeries Corporation

Labor Unions Can and Will Help on the Plant Safety Program

Gene Shepherd, Secretary-Treasurer, Teamsters Local 180

"Gimmicks" and New Ideas Have a Place in Your Safety Program

Leonard Gastzke, Head, Transportation Department, Langendorf United Bakeries

Friday, February 7—9:00 a.m.

Vehicle Safety—Delivering the Goods—a panel presentation
Effective Selection Must Include Investigation

Lloyd Coulter, Regional Personnel Director, Continental Bakery

Tailor-Make Your Program to Your Problems

Floyd A. Spencer, Supervising Engineer, Royal Globe Insurance Companies

Vehicular Maintenance and Safety Are Inseparable

Roy L. Hitt, Director of Transportation and Warehousing, Pepsi-Cola Corporation

The Positive Thinker Behind the Wheel Guarantees Success

Kenneth Hemphill, Safety Engineer, United Parcel Service

Welcome Creativity and New Ideas

Robert Rohr, Director of Accident Prevention, Interstate Bakeries Corporation

TRANSPORTATION, COMMUNICATIONS, UTILITIES SECTION

Thursday, February 6—1:30 p.m.

Arbitrations and Agreements

George Love, Arbitrator for International Longshoremen's and Warehousemen's Union and Pacific Maritime Association

Report on Truck Cab Noise Studies

Robert Hansen, California Trucking Association

Federal and State Roles in Accident Prevention

Julius Stern, Welfare Officer International Longshoremen's and Warehousemen's Union, Local 10

Friday, February 7—9 a.m.

Back Injuries and Lifting

Seymour L. Alban, M.D., Long Beach

The Training of Drivers and Supervisors

Ben F. Heinz, Director of Safety, Transport Indemnity Company

Open Forum

Glass Dangers

The growing role of glass in building construction—as doors, windows, walls and decorative facades—and the use of fiberglass drapes, curtains, tablecloths and bedspreads requires a special kind of alertness to avoid accident, the Greater New York Council reports.

Unless fiberglass fabrics are properly handled, tiny glass fibers may break off and be transferred to the skin, according to Mrs. Marjorie B. May, the council's director of home safety. Mrs. May prepared a bulletin "Living With Glass" which has been sent to 2000 women's clubs, P.T.A.s, civic groups and other organizations in the metropolitan area.

"A comparatively new type of accident," said Mrs. May, "is walking into a closed door in broad daylight. Some glass doors are so clear that a person approaching, especially if unfamiliar with the lay-out or having poor vision, may think there is no door there, or that it is open." The Safety Council urged use of safety bars, decals or decorative etchings for eye-catching identification of glass that is structurally used.

From the *Safety Journal*,
Anderson, S.C., March 1968

New USA Safety Standard to Reduce Injuries Caused by Glass Doors

The use of a recently approved USA Standard is expected to significantly reduce the over 40,000 injuries that result annually from persons colliding with glass doors and partitions.

USA Standard Performance Specifications and Methods of Test for Transparent Safety Glazing Material Used in Buildings, Z97.1-1966, was developed by a committee sponsored by the National Safety Council under USASI procedures. The purpose of the safety standard is to provide specifications and methods of test for transparent safety glazing material. Material made to conform to these specifications is expected to reduce and minimize the likelihood of human beings receiving cutting or piercing injuries. Estimates of the annual injury total caused by glass doors range from 40,000 to 100,000.

The National Safety Council has stated that "most, if not all, of the cutting and piercing injuries could have been prevented or limited in severity had safety glazing been used."

At a recent demonstration at Electrical Testing Laboratories in New York, a piece of tempered safety glass, developed by Pittsburgh Plate Glass

Co., was tested according to the USA Standard. The glass is from four to five times stronger than ordinary plate glass of the same thickness, and bent, rather than broke, under impact. The glass broke under an especially heavy blow, but "failed safe" by crumbling into small granular pieces, as required by the USA Safety Standard, rather than into large, sharp fragments.

The USA Standards Institute is the only organization that approves and issues voluntary national standards covering every field of technology designed to serve consumers, industry, government, safety organizations, and all other segments of society. These standards are developed with the active participation of members of all interested groups—manufacturers; distributors; trade; professional and labor organizations; consumer groups; and government. The Institute has published over 3000 standards to date.

James E. O'Neil, director of Industrial Service represents NSPB on the USA Standards Committee that developed the safety standard for glazing materials.

From *Wise Owl News*, Spring 1968

A Few Pictures from Many Regional GISC Meetings



Left to right: Verna Jones, President Santa Cruz Chapter, Women in Construction (WICS); Arnie Swenson, Vice President, Carl N. Swenson Co.; Billie Apple, President Santa Clara WICS Chapter No. 99.

Success of the Governor's Industrial Safety Conference depends greatly upon the Regional Meetings such as these.



Robert Jinkens opening Construction Section Regional Meeting at Hyatt House, Salinas.



A highlight of Governmental Agencies Regional Meeting in Redwood City was talk and demonstrations by Walter Van Sandt (left) and Kenneth Nobs.

Blazing Brandy Burns Beauty—Alcohol Explodes Killing Cook

Two recent restaurant accidents highlight hazards of flammable liquids and point out how to avoid fires and explosions while using these fluids.

While preparing Chateaubriand, a chef was flaming a beef tenderloin with burning brandy. He attempted to pour additional brandy from a bottle into the flaming dish. The brandy vapor ignited with explosive force throwing burning brandy on a waitress standing about six feet from him.

She suffered first, second and third degree burns to her chest, hands, arms, and thighs. Although her beauty was ruined by scars, she survived.

In another case, a cook attempted to pour denatured alcohol, used to fuel chafing dish heaters, into a small Sterno Canned Heat container. There was a flame inside the Sterno can which he may not have seen.

The gallon can he was pouring from exploded throwing burning alcohol over him. Although others in the kitchen tried to smother the flames by rolling him in a blanket, he died within a few minutes.

Corrective action taken after the first accident included.

1. Restricting the operation to trained personnel.
2. Avoidance of lace or frilly dress by those engaged in the operation.
3. Pouring the brandy into a chafing

dish and closing the bottle before igniting the brandy in the chafing dish. Never pour any flammable liquid into a hot dish or onto a flame.

4. Ladling the burning brandy into the hot dish for flaming the meat. This must be done with care—it is not a job for one with the shakes.
5. Performing the operation away from others, preferably in the kitchen. If it is done in the dining room, isolate the operation using a barrier.

In the second case, corrective action taken by various restaurants using chafing dishes include:

1. Using Sterno Canned Heat only.
2. Using alcohol fired chafing dish heaters with additional precautions as follows:
 - a. Store the alcohol in metal containers of 2 quarts or less. These are to be properly labeled.
 - b. These containers are stored away from any source of ignition. They should not be kept in the kitchen.
 - c. Pint safety cans are used for filling the heaters. This operation is done by a trained individual in a safe location.
 - d. All heaters are filled the first thing each morning, before the kitchen stoves are lighted.

Section 4149 of the California General Industry Safety Orders applies to the use of flammable liquids.

Safety Clubs

The March issue CSN described the Turtle Club, Wise Owl Club and the Golden Shoe Club; the June issue called attention to the Half-Way-to-Hell Club. Since then, we have learned of another; it is the

Kangaroo Club International

The Kangaroo Club International is a non-profit organization dedicated to encouraging the use of seat belts and other automotive safety restraining devices to reduce automotive crash injuries and fatalities.

The club was conceived by the Highway Safety Committee of the Chester County Safety Council of Chester County, Pennsylvania. In establishing the framework in which the club was organized, Chester County Safety Council officers recognized the need for some organization to tackle the job of motivating people to use seat belts through a continuing promotional program of information, education and awards. It was recognized that the legislation of seat belts into automobiles doesn't necessarily guarantee their use.

Kangaroo Club International was established with three principle objectives:

(1) To reduce the volume and severity of automotive crash injuries and the number of highway fatalities by promoting year-around the use of safety belts and other automotive safety restraining devices.

(2) To provide a source of statistics, materials, and tools to assist organizations in motivating their people to use automotive safety restraining devices.

(3) To accumulate data that could be of value to research groups interested in this subject.

An employee or member of a chartered organization may become a life member of Kangaroo Club International if, in the event of an automotive crash accident either on or off the job, he or she averted more serious injury or death as a result of wearing a safety seat belt or other automotive safety restraining device. The lifetime individual membership fee is \$2. The club endorses the general practice of member organizations paying the individual membership fee. Individual members will receive a pocket identification card, a framed membership certificate and a bronze lapel pin.

The application for membership is designed to provide data for statistical analysis for use in automotive crash injury research, as well as complete information for local stories to dramatize the effectiveness of seat belts and other restraining devices.

Member organizations will receive periodic issues of THE KANGAROO containing promotional information for motivating seat belt use, special awards based on accumulated photograph credits, and national recognition for this phase of their off-the-job safety efforts.

Currently there are 150 Chapters operating in industry and government. If you desire to establish a Chapter for your organization, request a charter application from:

Kangaroo Club International
Box 950
Coatesville, Pennsylvania 19320

Self-Cleaning Ovens

Some of the new electric stoves are equipped with self-cleaning ovens. An Iowa fire department recently received a call from a home where a woman had switched her new electric oven to "Clean," forgetting that she had placed a can of lard in the oven earlier in the day. This caused a considerable amount of smoke, and the fire department was called. They found the oven smoking badly, and the door locked. In order to get at the can of lard, they pried open the oven door, which damaged the safety locks of the oven. After they examined all the circumstances, they felt that it would have been unnecessary to break the oven door open, and suggested that Fire Service Information carry an article explaining the operation of self-cleaning ovens.

When these ovens are switched on Clean, the oven burners are turned on and the temperature in the oven begins to rise. At around 600° a special thermostat does three things: It locks the oven door, and turns on a special catalytic burner in the oven vent to catalyze the smoke that would otherwise escape into the room.

When the temperature inside the oven gets up to around 900°, the burners are automatically shut off and the oven cools off. When temperatures drop again to around 600°, the special thermostat shuts off the catalytic burner and the fan, and unlocks the oven door. The cleaning cycle can be interrupted manually at any time by switching the oven control to Off. This, of course, would not shut off the special catalytic burner or unlock the oven until the temperature dropped to 600°.

From *Federal Fire Council News Letter*, Washington, D.C. 20405, May 1968.

A Regal Example

Queen Elizabeth II does not usually wear glasses. But during a recent visit to a diesel engine factory in northern England, the Queen boosted the plant eye-safety program by donning a pair of safety glasses which the management provides as a precaution against eye injury.

From *Wise Owl News*, Spring 1968

Editor Joins Turtles

If it can happen to your Editor it can happen to you, too.

The reason Garry Jewett was wearing a hard hat, on a special assignment to obtain photographs for slides illustrating the noise reduction program in lumber planing mills, was that he knew this industry requires every employee to wear a hard hat on entry to the premises. Otherwise he normally would be without head protection. (See article on page 3)



Left to right: Harold Cochran, President, San Francisco Chapter, ASSE; Jack F. Hatton, Chief Division of Industrial Safety, Garry W. Jewett, Jr., and Carl Bromham, Northern California District Sales Manager representing E. W. Bullard, Jr., sponsor of Turtle Club.

Hatton made the presentation at the executive committee meeting, S.F. Chapter, ASSE on December 11, 1968. The citation reads:

"Garry W. Jewett, Jr. is Editor of the California Safety News, publication of the California Division of Industrial Safety, San Francisco. On August 26, 1968 while on a safety assignment photographing planing mills from catwalk of a bridge crane, he started to climb over a railing to get on top of the cab. Not seeing a narrow "I" beam, he came up under it, striking his head with great force. The safety hat Mr. Jewett was wearing cushioned the blow and completely protected him from serious head injury."

As indicated in the March 1968 (page 13) issue of *California Safety News*, the Turtle Club is sponsored by E. W. Bullard, Jr., president of the company of the same name, 2680 Bridgeway, Sausalito, California 94965. There are more than 8000 members with over 1700 from Canada. The remainder are from the United States, Australia, New Zealand, Mexico and many European and Central and South American countries.

The "Boom" in Accidents

Effective loss control management is a vital factor in whether or not businesses continue to operate or fold up and throw in the sponge.

The National Safety Council reports that "during times of high competition and low profit margins, safety may contribute more to profits than industry's best salesmen."

The table below, published in the NSC Accident Facts for 1961, shows the dollars of sales required, at varying profit margins, to pay for different amounts of accident costs.

SALES REQUIRED TO PAY FOR ACCIDENTS					
Profit Margin					
Accident Costs	1%	2%	3%	4%	5%
\$ 1,000	\$ 100,000	\$ 50,000	\$ 33,000	\$ 25,000	\$ 20,000
5,000	500,000	250,000	167,000	125,000	100,000
10,000	1,000,000	500,000	333,000	250,000	200,000
25,000	2,500,000	1,250,000	833,000	625,000	500,000
\$100,000	\$10,000,000	\$5,000,000	\$3,333,000	\$2,500,000	\$2,000,000

With a little more effort the profits can be shown in terms of products or services produced. (Meals served, autos sold, etc.) By putting a price tag on the industrial accident problem and then personalizing it, employers are much more likely to emphasize safety efforts.

From July 1968 Newsletter, State Compensation Insurance Fund

18 Stories Up to Repair Damage

A giant crane with a boom as tall as an 18-story building was used by the San Diego Gas & Electric Company to solve a recent high-in-the-sky electrical repair problem.

The problem was posed when a conductor of a 138,000 volt power line was found to be damaged in the middle of a 3500-foot span and 197 feet in the air.

A check through binoculars disclosed that the line had been nicked, apparently by a bullet.

The power line stretched across a river valley between two towers located on rugged rocky slopes. The terrain virtually precluded the use of equipment to lower and restring the damaged conductor. To send a man out from one of the towers and then lower him to the ground from mid-span was felt to be too hazardous.

As an alternative, the company obtained permission from the California Division of Industrial Safety to use a crane to hoist two linemen up to the damaged conductor. Linemen Harry Mendel and Dave Farmer volunteered for the job.

To provide the lift, the company leased a crane with a 250-foot boom. The boom was trucked in sections to

the site where it was assembled and later dismantled.

T. I. Jarrard, safety supervisor for the San Diego Gas & Electric Company, coordinated safety procedures and preparations, and a State Safety Engineer was at the site to oversee the entire operation.

The repair project was scheduled for early morning before the prevailing wind came up.

Once underway, the job was carried out quickly and efficiently. The 138,000 volt line was de-energized and grounded. Mendel and Farmer climbed into a 4 by 6-foot steel basket with waist-high sides, fastened their safety belts, and signaled for the lift-off.

Using a battery-powered telephone instead of hand signals, Farmer gave instructions to the crane operator for positioning the basket.

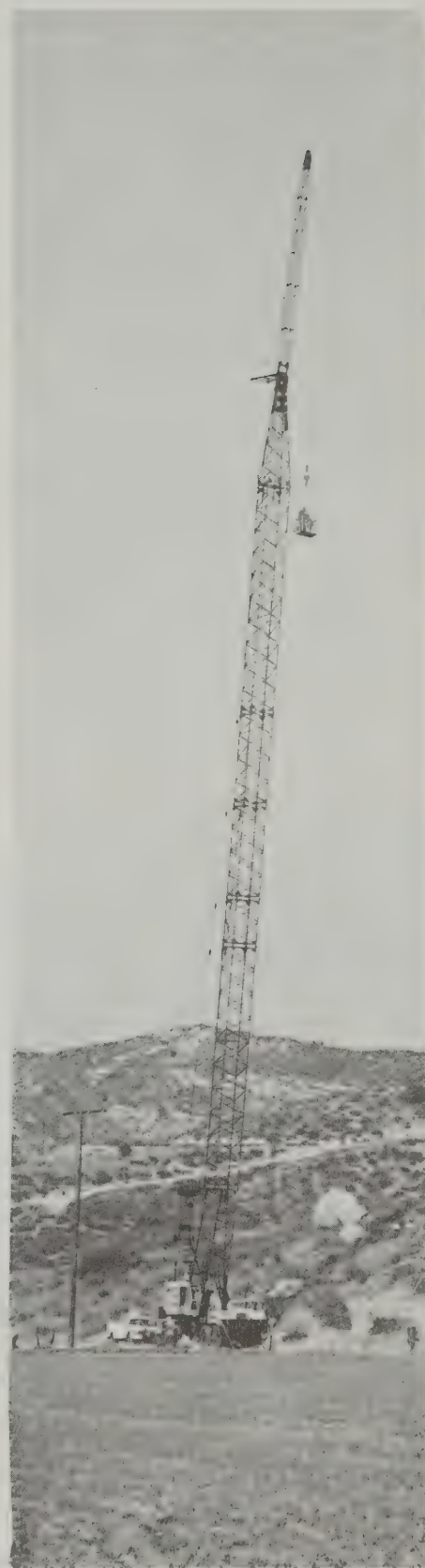
Within 20 minutes from the time they started up, the two linemen reinforced the damaged line with a pre-formed aluminum splice and returned safely to the ground.

While the repair job itself required but a few minutes, the performance resulted from careful planning and execution of established procedures.

From SDG&E News Bureau, San Diego



Assembling Sections of Giant Crane



Hoisting repairmen.

1.4 Million Safe Manhours

Attainment of more than 1.4 million manhours without a lost time injury was celebrated by the McDonnell Douglas Corporation's Sacramento Test Center on August 8, 1968.

In special ceremonies, the Industrial Indemnity Company of America, insurer for the facility's 1040 employees, presented the McDonnell Douglas Astronautics Company—Western Division with a plaque commemorating the outstanding safety record.

Harold E. Felix, Director of the Sacramento Test Center, accepted the plaque from Neal Gates, Industrial Indemnity Representative. "All of us deeply appreciate the significance of this honor, which is testimony to the dedication and hard work of our employees in maintaining the highest standards of safety," Felix said.

He paid tribute to the Center's Employee Safety Department, which is responsible for the establishment of safe work procedures, the indoctrination of employees in proper methods of handling potentially hazardous ma-

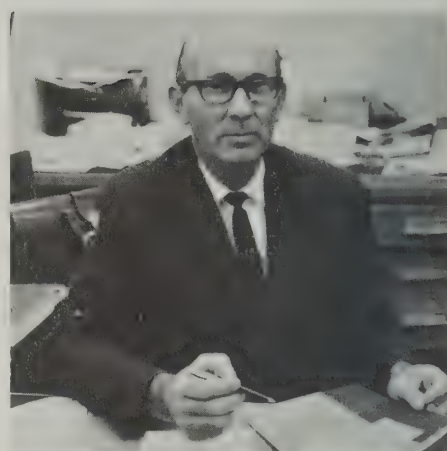
terials, and the inspection of all facilities and equipment on a regular basis.

"Through the efforts and cooperation of all our employees," Felix said, "the incidence of lost time injuries has been dramatically reduced from a frequency rate of 5.6 in 1965 to only 2.4 in 1967. As of today, we have worked 256 consecutive days without a lost time injury."

The Center conducts all types of testing of propulsion systems for rockets and space vehicles, including the S-1VB top stage of NASA's uprated Saturn 1 and the mighty Saturn V Lunar Launch Vehicle. The S-1VB is produced at the Western Division's Huntington Beach facility and flown to Sacramento for acceptance firing and checkout prior to shipment to Cape Kennedy.

The presentation marks the first time that the goal of one million manhours without a lost time injury has been achieved by the Sacramento Test Center.

Built for Pressure? Don't Blow Your Top!



By Frank M. Reid, Boiler Inspector,
City and County of San Francisco

A San Francisco City Ordinance requires that all air pressure tanks operating at more than 15 psi be inspected at regular intervals, and to be constructed to the American Society of Mechanical Engineers' Unfired Pressure Vessel Code.

Recently, a serious hazard was noted in a tank constructed to operate at atmospheric pressure, but actually being subjected to pressure.

Chemicals were being mixed in the tank by blowing high pressure air through an internal pipe. The bubbling of the air from the bottom to the top of the fluid mixed the chemicals. At the top was a vent, intended to relieve the air pressure.

The ends of the tank were seen to be bulged. Only a glance was needed to see that the atmospheric vent was closed.

Previously, the chemical solution had foamed out of the vent, either because the tank was too full, or too vigorously agitated. To stop the overflow, the operator had plugged the vent.

A few pounds per square inch of air pressure, multiplied by the number of square inches in each flat end of the tank, was all that had been required to cause the bulges. The high pressure air being used was 200 psi, and the tank had a diameter of three feet. Had the full available pressure been permitted to build up in the tank, the maximum load would have exceeded



Mr. N. F. Gates presents a plaque to Mr. H. E. Felix commemorating attainment of more than 1.4 million manhours of operation without a lost time injury at the Sacramento Test Center of McDonnell Douglas Corporation.

1st row—left to right—Mr. Geo. A. Sherman, Assistant Chief, Division of Industrial Safety, State of California; Mr. H. E. Felix, Director, Sacramento Test Center; Mr. N. F. Gates, Senior Safety Engineer, Industrial Indemnity Company; Mr. J. A. Hopkins, Director, Employee Safety Department.

2nd row—left to right—Mr. K. B. Brown, Manager, Sacramento Safety Council; Mr. G. W. O'Brien, Regional Manager, Employee Safety Department; Mr. J. W. Carroll, Assistant Director, Operations, Sacramento Test Center; Mr. Q. R. Ray, Supervisor, Employee Safety Department, Sacramento Test Center.

200,000 pounds. However, needless to say this unsafe condition was corrected immediately.

In another instance, a young workman was testing an oil tank for leaks by using compressed air. He had an air gauge and hose line, but apparently was not told what pressure to use for the test.

He connected one end of the hose to an air bank used to start diesel engines—at a pressure of 250 psi—and the other end to a fitting on the tank top. He was standing on the tank top

to check the air gauge when he opened the valve. The tank exploded, tearing off the $\frac{1}{4}$ -inch steel top. The young man was hurled against piping at the ceiling, and was killed instantly.

Before applying compressed air to any tank, know the operating pressure for which it is designed and stamped and never exceed it. If it is not built for pressure, introducing even a few pounds per square inch can be dangerous. The larger the tank, the lower the pressure needed to rupture it. *Don't blow your top!*

Editor's note: Your editor called on Frank Reid, a few years ago to condemn an air tank. It consisted of a compressor on an old tank from a home type water heater. The owner of the tank was directed to take it out of service until it had been inspected.

Frank's reaction was emphatic. "Boy," he said, "when I saw that tank I almost ran. No gauge! No relief valve! The owner was operating it manually by shutting off the motor whenever he figured he had enough air pressure. What a bomb!"

Spreckels Sugar Company, Factory One, Salinas, Receives NSC Award of Honor

Superior safety performance over a three-year period was recognized by the National Safety Council in granting an Award of Honor to the Spreckels Sugar Company, Plant One, Salinas.

The Award of Honor was made on the basis of the following excellent record:

	Frequency	Severity
1. Injury rates for 1967.....	14.39	803
2. Injury rates for 3 prior years.....	49.82	3694
3. Sugar Beet Industry Rate 1964-1966.....	29.33	2542
4. Par Rates ($\frac{1}{2}$ the sum of lines 2 and 3).....	39.58	3118
5. % for Spreckels for 1967 better than par.....	64%	74%
6. % better than par required for AWARD OF HONOR.....	62%	30%

Presentation of the Award, one of Industry's most coveted distinctions, was made by Jack Hatton, Chief of the Division of Industrial Safety, to James Reese, Spreckels plant manager, on July 17, 1968. The ceremony was held in the Spreckels Veterans Memorial Hall and was attended by more than 300 employees of the firm.

In his talk to the gathering at the meeting, Mr. Hatton complimented management and labor for the fine team effort in accomplishing such a significant decrease in lost time accidents. "Even more significant is not the small number of accidents, but the vast number that did not happen in the millions of man hours worked," he said. Referring to the Award of Honor he stated that "Among the 400,000 businesses and industries in California you can count the Award of Honor recipients on one hand". He praised the company for actively promoting Industrial Safety by well-designed guarding of machinery, equipment, employee training and incentives and excellent cooperation with the State Industrial Safety Division. He emphasized the importance of team work, indicating that, "You can't have a winner without the efforts of everybody." Finally, he cautioned against complacency in taking Safety in stride and urged the continued good work in winning the Award.

Spreckels officials attending included:

E. W. Beck, vice-president of Operations;
R. T. Johnson, vice-president of Agriculture;
J. M. Dendrick, Agricultural Manager;
R. M. Campbell, Chief Maintenance Engineer, all of San Francisco, and
Elmer Mattart, Safety Supervisor, Salinas.

In addition to Jack Hatton, the Division of Industrial Safety was represented by:

Ed Brubaker, Supervising Engineer, San Francisco;
Dave Valoff, Senior Safety Engineer, Fresno, and
Stan Woyciehowsky, Industrial Safety Engineer, Salinas.

DISABLING WORK INJURIES^a TO CARPENTERS IN THE CONSTRUCTION INDUSTRY
California, Three Months, 1966

Table 1--Injuries to Journeymen and Apprentices, by Branch of Industry

Branch of industry	Total	Journeymen	Apprentices
All construction	<u>1,084</u>	<u>1,025</u>	<u>59</u>
General building contractors and operative builders	<u>824</u>	<u>775</u>	<u>49</u>
General contractors, other than building	<u>134</u>	<u>125</u>	<u>9</u>
Highway and street construction	<u>47</u>	<u>44</u>	<u>3</u>
Tunnel construction	4	4	-
Sewer, pipeline, and other trench construction	10	10	-
Other heavy construction	73	67	6
Special trade contractors	<u>126</u>	<u>125</u>	<u>1</u>
Structural steel erection	9	9	-
Plumbing, heating, air conditioning, sheet metal	7	7	-
Painting and paperhanging	1	1	-
Electrical	1	1	-
Masonry, stonework, plastering, etc.	3	3	-
Carpentering and floor laying	27	27	-
Roofing	18	17	1
Cement and concrete	25	25	-
Water well drilling	1	1	-
Insulation and acoustical	11	11	-
Other special trade contractors	23	23	-

^aDisability causing absence from work for a full day or shift beyond the day of the injury.

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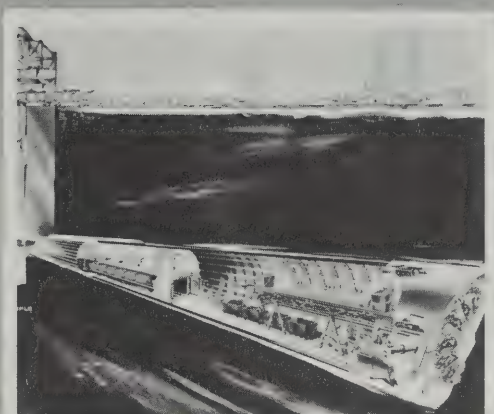
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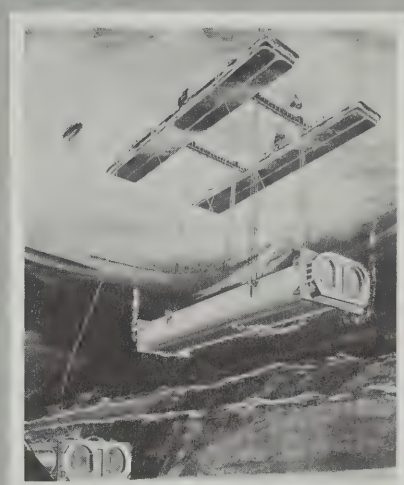
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First Tube Launched



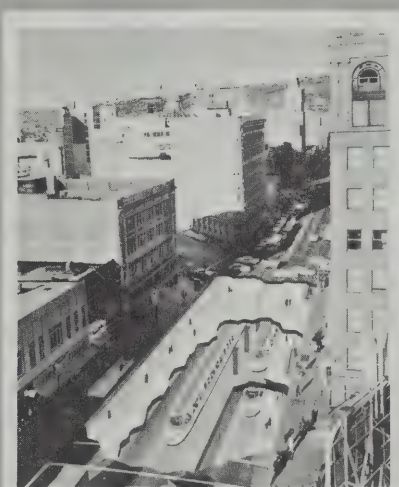
Tunneling Under Bay



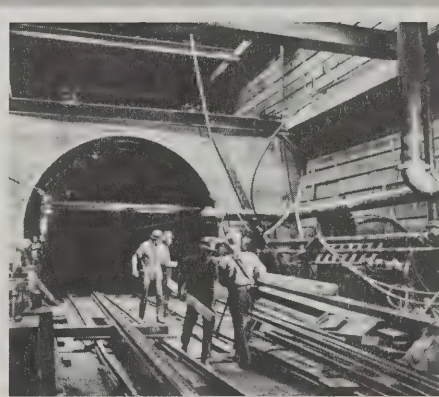
Positioning a Tube



Finished Subway
Downtown Berkeley



Subway Station
Downtown Oakland



Under Mission Street
Downtown San Francisco

BAY AREA RAPID TRANSIT
WORLD'S LONGEST CONSTRUCTION PROJECT

(See page 11)

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The California Safety News is mailed free of charge to those interested in industrial safety.

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Cover photos courtesy BART

Virgil L. Collins Reappointed to Industrial Safety Board



Governor Ronald Reagan reappointed Virgil L. Collins to a four-year term on the Industrial Safety Board; the announcement was made in May 1968.

Collins, a Democrat and Los Angeles County labor union leader, was first named to the Board in 1965. He is financial secretary-treasurer of the United Auto Workers local 216.

3 Million Manhours

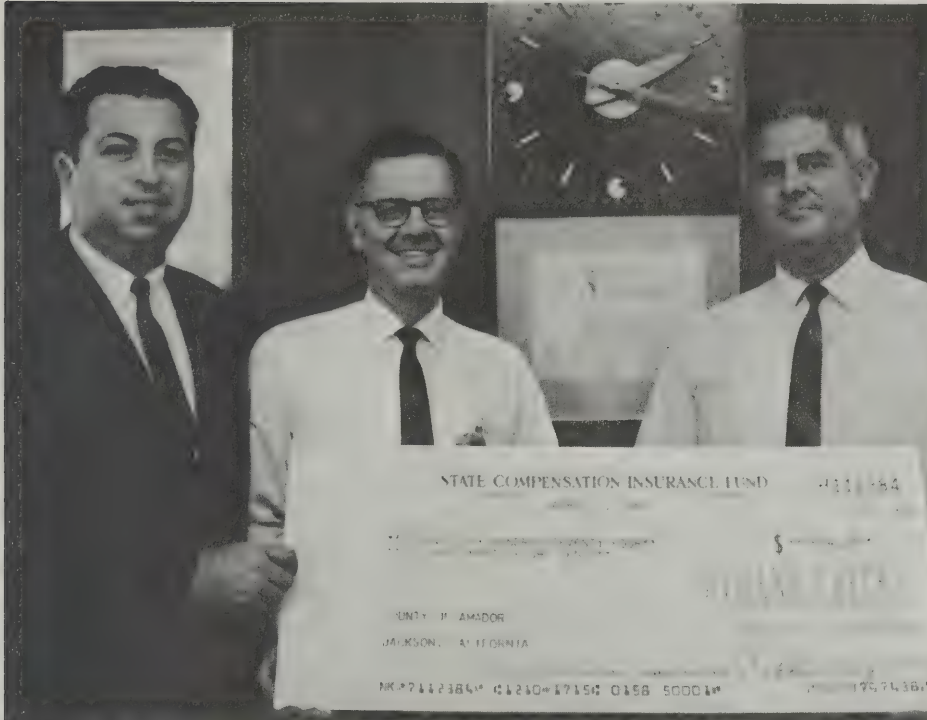
The bulk operations department at Union Oil Company's Los Angeles Refinery recently posted a record 3 million manhours without an on-duty lost time injury. The 120 employees of the department amassed the impressive safety statistic over a 10-year period dating back to December 20, 1957.

The department is responsible for handling 110,000 barrels of raw materials a day including the blending, storage and shipment of all refined products. In addition, the department operates the Los Angeles Harbor Marine Terminal working with Union's tanker fleet, barges, pipelines and approximately 236 product storage tanks. It also provides steam for the operation of various facilities at the refinery.



RECOGNITION. Los Angeles Refinery manager John Hopkins (front left) presents framed certificate to William Stark, bulk operations department superintendent, for 3 million accident-free manhours. Others (from left, 2nd row) George Cassel, Robert Myers, Clyde Bernhardt and Fred Sherman; third row, Gerald Rilea, Fred Folts and George Baumgartner; fourth row, Tom Kelly, Harry Gorgeois, Bill Davis and Russ Rentzel. They move 110,000 barrels of oil a day.

Safety Program in Small County Pays Big Dividends



Shown from the left are: Ronald H. Weber, Safety Representative, State Compensation Insurance Fund; George C. Cotton, Amador County Safety Director, and Elgin R. Bowers, Chairman, Board of Supervisors, Amador County.

The ceremony pictured was obviously staged to impress you, and it should—for the check pictured is an enlargement of one of two real checks, from the State Compensation Insurance Fund for returned dividends, which were delivered to George Cotton in April 1968. The two checks totalled \$10,378.67, returned dividends as a result of a safety program established in 1965. These dividends were in addition to other savings—which should impress you even more.

Little Amador County, cached away in California's Mother Lode, far from roaring industry and humming freeways, was suddenly jarred into a realization that it was not immune to the high cost of accidents. After three consecutive years of receiving no dividends from the State Compensation Insurance Fund and running a loss ratio as high as 225%, the Board of Supervisors decided to do something about it.

Looking around, they found that they had an employee in the County service with safety and accident pre-

vention background and appointed George Cotton to the part-time position of Safety Director. Cotton did only what any experienced safety man would do. He wrote and published a comprehensive safety program; set up a safety committee composed largely of department heads; established close liaison with their Supervising Safety Representative of the State Compensation Insurance Fund and with the Safety Engineer, California Division of Industrial Safety. The program, with the full cooperation of the Board of supervisors and other County officials, rapidly spread to the employees and the results have really paid off.

Last year, Amador County had no lost-time accidents and won the California County Employee Safety Contest Award sponsored by the State Compensation Insurance Fund and the County Supervisors' Association for the lowest injury frequency rate in California. (Note the award certificate pictured under the board room clock.)

Concurrently, their experience modification dropped their premium rate to 94 percent of average. This means

the County pays about \$3550 less than the average premium. The rate has been further modified downward to 91 percent which means even greater annual savings in premium payments in addition to the dividends. And that isn't all. In addition to the direct costs of accident insurance, we should also consider the uninsured costs the County is saving. Uninsured costs have been estimated to range from a ratio of 1 to 1 to as high as 7 to 1 as compared with insured costs. A very conservative estimate would indicate savings of uninsured costs of about \$50,000 annually.

"This year," Cotton said, "the County could also expect recognition for being accident-free." By this statement, Cotton was forecasting that the County would be hard to beat in the safety contest, that there is possibility of additional reductions in premium payments, further dividend checks may be expected and there will be continuing savings of uninsured costs of accidents.

Is there better proof that safety pays, and pays, and will continue to pay?

Trinity Aides Who Shun Safety Devices Face Loss Of Jobs

Trinity County employees who receive three warnings for safety rule violations will be faced with the loss of their jobs in the future.

This was decided by the Board of Supervisors following a discussion on purchasing safety equipment for employees who refused to wear it. Ron Maravirov, safety director for the county, said his office had little authority other than to warn individuals.

Supervisor Harrison of Hayfork moved that persons who are caught violating safety rules for the third time be terminated from employment by the county. The motion was adopted unanimously.

From *Sacramento Bee*, July 18, 1968

Shoring Methods Demonstrated For Excavations

Mrs. Barbara Councilman, Personnel Assistant and City Safety Coordinator for the City of Santa Cruz, who supervises the overall safety program for city employees, requires each department to arrange and conduct monthly safety programs.

Mr. Weston Webber is Director of Santa Cruz City Water Department. His assistant, Robert Johnson, in charge of their safety program, assigned Jim Lee, general foreman, to arrange a shoring demonstration for the department which was conducted on May 1, 1968.

The demonstration consisted of digging a trench 40 feet long, varying in width, depth and slope. The trench was then shored by different methods using appropriate equipment including screw jacks, hydraulic shores, or wooden timbers as required.



Preparing trench.



Group observing various approved shoring methods.

Pacific Trencher Company, Hayward, California, furnished hydraulic shores and demonstrated their proper use.

The Flasher Company, San Jose, California, provided barricades and traffic control devices displayed in conjunction with the shoring demonstration.

Mr. Robert Jinkens, Safety Engineer, Division of Industrial Safety, conducted the shoring demonstration. Following this he distributed two Division of Industrial Safety Bulletins pertinent to shoring excavations. These are: Bulletin S-146, "Safety in Pipeline Construction" and Bulletin 158, "Protection of Workmen in Trenches." These bulletins are available on request from the Division.

Any California contractor or governmental agency interested in conducting a similar demonstration of shoring methods is invited to request the Division of Industrial Safety to arrange for such a program.

Trench Caved In Employee Killed Contractor Prosecuted

Because of inadequate shoring, a trench caved in causing fatal injuries to Felipe Rodea, an employee of Perata Excavation Company of Tahoe City.

Gerald J. Perata (also known as Peter Perata), owner-operator of Perata Excavation Company, was prosecuted by Deputy District Attorney Thomas S. Harte. The company had violated California Construction Safety Orders 1540, 1541, and 1511, and Labor Code, Sections 6401 through 6405, 6406(d) and 6416.

Perata pleaded nolo contendere to violation of Labor Code 6400. Judge Ronald G. Schiess, in Justice Court, Auburn Judicial District, Placer County, fined Perata \$400, plus costs and placed him on 36 months' probation (the terms of which were that he not violate any of the laws of Labor Code or State Contractors Licensing Board with respect to safety) and suspended a 30-day jail sentence.

Capable Constable

The quick action of a constable saved the life of a workman employed by a concrete readymix plant. The workman, Ivan McClurg of Riverside, California, in an attempt to free blocked sand, had climbed down a ladder to a position about 4 feet from the bottom of a 12-foot sand bunker. He started to shovel the wet sand onto the feeder belt hoping the sand would then start flowing by itself. The sand clinging to the sides of the bunker above his head did start flowing, with the result that the workman was knocked off the ladder and covered up to his chest.

A co-worker, sizing up the situation and deciding he needed help, called the local constable, Adrien E. White of Caruthers. Mr. White came immediately to the scene of the accident.

His first action was to cut off a 16-foot section of garden hose and pass one end to the victim. White instructed the workman to place the end of the hose in his mouth, and only to breathe through the hose—just in case of any sudden collapse of the sand.

White then tied a rope under McClurg's armpits. A barrel, open on both ends, was placed over McClurg's head, with a garden hose passing under the barrel. The constable then constructed a plywood box around the workman. A water hose was used to wash the sand from around McClurg's feet onto the feeder belt. Eventually, all the sand was washed from around McClurg's body and he was hauled out of the bin by the rope.

The buried workman was in a state of shock, but otherwise uninjured. The rescue was well thought out but most important, it was successful.

Jack F. Hatton, Chief of the Division of Industrial Safety, wrote White commending him for his actions. Indeed, White is a capable constable.

Transferring LP-Gas Has Caused Injuries

By Paul J. Carosella, Senior Safety Engineer
Division of Industrial Safety

A tractor operator on a ranch was seriously burned during an LP-Gas refueling operation. The vapor connection was gagged open, releasing large amounts of gas. He stated that he had stopped the engine and did not smoke, so static electricity may have been the source of ignition.

Since this was the second accident of this nature at the ranch, transfer pumps are now being used instead of gagging the vapor connection open.

California Safety Order 472(a) prohibits the venting of liquefied petroleum gas (LP-Gas) to the atmosphere unless the vent is led to a safe place. Violation of this simple regulation by indiscriminate, unsafe venting while filling farm vehicle fuel tanks has caused more accidents than any other single violation of our LP-Gas safety orders. Usually the person burned was the man filling the tank.

In this unsafe transfer operation, the vapor pressure is reduced in the receiving vessel by jamming the vapor return check valve open. This releases large amounts of gas to the surrounding area and creates a pressure differential which permits liquid propane to flow through a hose connection from the charging vessel into the mobile fuel tank.

When the fuel tank is on a farm machine which has recently been in operation, which is usually the case, this tank has been warmed by the heat from the engine. Since the pressure in an LP-Gas container is dependent on the temperature of its liquid contents, vapor is released in sufficient quantities to cause the temperature of the remaining liquid to drop through evaporation before transfer begins. You can see this procedure is not only unsafe but also releases valuable commodities to the atmosphere. The hazard is real and the cost of the vented gas is significant even if there is no accident. Probability of ignition is increased by the fact that air containing 2.4% to 9.5% propane is a flammable mixture and a source of ignition is usually nearby.

Filling operations from stationary dispenser tanks or from trap tanks should be done using a properly designed liquid pump or vapor compressor. Relatively new types of pumps and compressors are available for locations remote from electric power supply. These can be purchased as separate units and mounted at a stationary tank located away from any source of electrical power, or on a trap wagon suitably fitted for the service. This arrangement not only provides for greater safety but is also economically desirable since the gas is retained in the fuel tank for use as fuel and transfer is much quicker.

If it is necessary to vent gas to the atmosphere through an orifice larger than number 54 drill gage size, be guided by the following safe practices:

(a) Vent through a standpipe 10 feet high as a minimum and direct the vent away from all sources of ignition. The purpose of this is to minimize settling of the LP-Gas at ground level.

(b) The connection should be made to a manually operated vapor valve such as a POL service valve. This gives you control for shut-off or for throttling. (Never use the vapor return check valve connection for this purpose.)

(c) Before the transfer operation, stop the vehicle engine and make certain there are no sources of ignition in the immediate area.

(d) While transferring, prevent vehicles or other sources of ignition from approaching.

(e) Do not permit smoking in the vicinity.

(f) Don't fill beyond the safe level (86½%).

(g) The above procedure should be used only in field operations, not in the vicinity of buildings.

(h) The person performing the transfer operation must be properly trained.

Engines which were hot but had been stopped have been suspected as the source of ignition of released vapors. Personal clothing made of synthetics has also been suspected as the source of ignition by static electricity particularly in dry climates of the inland valleys.

The careful venting to a safe place is required to prevent serious fires and injuries.



Author shown with small engine-driven transfer pump. These engines have special spark arrester muffler and shielded ignition system for safety.

How Not To Use LP-Gas Vapors

LP-Gas (Liquefied Petroleum Gas) is meant to burn in an approved appliance or in an engine as motor fuel—and NOT in illegal and dangerous ways that could result in severe injury to people and damage to property. Let's make sure that LP-Gas vapors are not used to:

1. Blow out sewer lines
2. Blow out space heaters
3. Blow out radiators
4. Blow out kitchen sinks
5. Blow out water lines
6. Blow out flues.
7. Clean motors
8. Remove paint
9. Charge paint guns (in lieu of using air)
10. Inflate tires
11. Clean vent pipes
12. Freeze bees
13. Run rodents out of barns
14. Kill ants
15. Blow air horns

From "The Gas Lite," May 1967

Hard Hats In Britain

The following is quoted from a British paper "Safety and Rescue," June 1968:

Coshing-in On Safety

ONE OF THE most hated sections of society—the debt collectors—now have their own special form of personal protection against assault.

THEY WEAR trilby hats with fibreglass shells inside which easily ward off any unexpected blows.

MANUFACTURED by Charles Owen and Co. (Bow) Ltd., the hats are designed to withstand a force of 90lb. Thousands are sold each year to debt collectors, rent collectors and bank messengers carrying money.

WALTER BUREK, the firm's director told me: "These hats have been well tested by being heavily coshed and have 10lb. weights dropped on them."

They should make debt collectors feel more secure . . .

Ed. Note: A cosh is a blackjack.

Crane Boom Stops

Senate Bill 788 was signed by Governor Reagan on June 27, 1968. This law requires that every crane with a cable-controlled boom and a lifting capacity of 10 tons or over be equipped with an energy-absorbing boom stop to provide a specified gradual buildup of pressure within a certain range of boom movement.

The law will become effective September 25, 1968, and will supersede the Division's Safety Orders applying to boom stops.

For information concerning approved boom stops, contact the nearest District Office of the Division of Industrial Safety. Senior Safety Engineers will be provided with these lists of approved boom stops before the effective date of the law. A list of addresses and phone numbers of District Offices appears on the back cover of the June 1968 issue of this journal.

"How many times have I seen a boiler operator blow down a high pressure boiler with the quick-opening valve, with the accompanying water hammering and banging, never realizing how close to death he really was . . ."

OPERATOR

SCALDED WHEN BOILER

BLOW-OFF LINE FAILS

Careful installation and well-regulated operation of boiler blow-off equipment are essential to the safety of both the operator and the boiler.

When a boiler is being blown down, the blow-off line is subjected to severe shocks from rapid temperature changes, sometimes accompanied by impact forces from water hammer. Therefore, blow-off valves should be opened slowly, and where one slow-opening valve and one quick-opening cock are used, they should be operated in the proper order. The quick-opening cock should be opened first, then the valve slowly opened, so that the flow of water through the line can be carefully regulated. When closing the line, the slow-opening valve should be closed first.

The need for careful handling of blow-off equipment was emphasized recently by an accident that resulted in the serious scalding of the operator. Also, it caused considerable damage to electrical equipment in the small factory.

The usual procedure at this plant was to blow down the 100 psi firebox boiler each evening, after plant operations had finished for the day. The

blow-off line was equipped with a slow-opening valve next to the boiler and a quick-opening cock about 12 inches from the valve. The accident happened when the operator started to blow the boiler down.

From information obtained at the accident investigation, it was evident that the operator opened the valve first; then, as he opened the cock, the sudden impact of water striking an elbow in the line at high velocity, broke the connection where the pipe was screwed into the outlet side of the cock, stripping the threads. A jet of boiling water shot out of the broken pipe line, struck a wall 2 feet behind the boiler, and was deflected onto the operator.

Escaping steam and water prevented other employees from closing the blow-off valves, and in a very short time the boiler was emptied. The boiler-room floor was flooded to a depth of 8 inches, and several motors, driving auxiliary boiler equipment, were damaged. Fortunately, there was a low fire in the furnace, and damage to the boiler was confined to leakage at a few staybolts and tube ends.

From THE LOCOMOTIVE, Fall/1967

New Boiler Regulations Reduce Accidents

By P. J. Carosella, Senior Safety Engineer, Division of Industrial Safety

The Boiler and Fired Pressure Vessel Safety Orders as last amended became effective December 2, 1966, after extensive study. They contain comprehensive revisions on controls for low pressure boilers. Since then, there have been no accidents reported to the Division of Industrial Safety involving a low pressure boiler equipped in accordance with this standard.

Investigations made by the Division had shown unmistakably that accidents involving those boilers which are automatically controlled were caused by malfunction of the controls, lack of controls or improperly installed controls in most cases.

The term "low pressure boiler," as used in California, covers those boilers used in industrial processes as well as those used for space heating in places of employment. It includes steam boilers at pressures up to 15 psi and hot water boilers at pressures up to 160 psi and temperatures up to 250°F.

The revised control regulations are based on standards that had been used as recommended practices in this State for twelve years. Safety Order 763 now makes mandatory providing two sets of controls—operating and safety—on automatically controlled low pressure boilers.

The operating controls maintain the pressure, temperature, water level and firing conditions within the range at which they are set. The safety shutdown system is required as a back-up to the operating system. Its components will operate to shut the burners down only if there is a malfunction in one of the operating controls that would result in an abnormally low water condition, an abnormally high pressure or temperature condition, or an unprogrammed flame failure.

In addition to the operational fuel shutoff valve, a safety shutdown fuel valve is required as part of the back-up system. Thus this system can be designed to shut the burners down in the event of any presently conceivable failure of the operating system, including mechanical failure of the operational fuel valve.

An important part of the regulations requires manual resetting when the boiler is shut down by a safety control, and the operator is required to locate and correct the condition that caused the safety shutdown before placing the boiler back into service. Another important part of the regulations requires that the controls be checked by a person familiar with boiler controls after installation and before placing into service. Significance of this requirement had been disclosed by accident investigations which show that in many cases controls had been installed on boilers but had either been improperly connected or had not been connected at all. It is the responsibility of the user to see this is done.

The electrical circuits involved are required to be two-wire with one conductor grounded with a maximum voltage of 120 and the control must be in the ungrounded conductor. As with all electrical wiring in places of employment, the Electrical Safety Orders of the Division apply.

In the ASME Heating Boiler Code, reference is made to several national standards on safety controls which offer good guidelines to the boiler manufacturing industry. Purging of furnaces and breeching seems to be the area of least agreement in the standards, and in the industry particularly, as to whether pre-purge, post purge or no purge at all affords the most assurance against furnace explosions. The California regulations require a means of providing "adequate combustion chamber purging" and this is to be provided by the manufacturer or contractor installing the controls on automatically fired boilers. Proper purging will differ with the different types and sizes of boiler-burner combinations and if the responsibility for the design and incorporation of purge is to be placed anywhere it should be with the manufacturer who makes the boiler or who installs the controls.

The manufacturer is also required to affix a permanent plate to the boiler, which shall contain proper methods of lighting, relighting and shutting down the burners along with type of fuels and fuel pressure limits.

A table is included in the California regulations which shows the time limits in seconds for shutoff of the safety shutoff fuel valve following flame failure. These shutoff times vary with the type of primary flame safeguard system and with the type of fuel and firing rates. No reference is made to sensing time or response time. Only shutoff time is used and this is defined as the time in seconds between pilot flame extinguishment and full closure of the safety shutoff fuel valve. This total time is the most significant interval which can be used, for it can be measured with some degree of accuracy when checking the controls.

In the operations of low pressure boilers in California, all boilers must be under the direct supervision of a responsible person. Such person is responsible for:

- (a) safe operation of the boiler by a competent attendant, and
- (b) proper maintenance of the boiler controls and devices.

The degree of attendance on low pressure boilers is the responsibility of management but, as is the case with power boilers, proper operation and maintenance are mandatory. The installer is required to furnish with each installation of low pressure boilers an operating manual giving complete operating instructions and the user shall require operating personnel to become thoroughly familiar with them.

California law does not make mandatory periodic or installation inspection of low pressure boilers. However, each request for inspection made to the Division of Industrial Safety is followed up and this does include low pressure boilers. Its safety engineers do also participate in safety programs and give educational talks concerning all types of boilers, whereby accident prevention is the primary objective.

"Hundreds Made Homeless as Bombs Fall" **"20 Killed, 50 Injured by Exploding Boiler"**

While the incidents described in headlines such as those above occur at different times in different parts of the world, they are far more related to one another than would appear at first glance. True, bombs are intentionally designed as a means of destruction, and boilers for more constructive purposes, but at this point the dissimilarity ends and they become identical in many respects.

First—either is capable of inflicting tremendous damage. Second—if a person pays no attention to established safe practices, or is careless in maintaining or handling either one, disaster will more than likely be the final result. Third—and almost without exception, the uninformed are amazed at the amount of damage that the smallest of either bomb or boiler can inflict.

So, if we can refer to these boilers as bombs, and I believe that this is entirely appropriate, then where is the fuse of this particular type of bomb? Any shell, projectile, or explosive, in order to be effective, must have a fuse or activator, and if boilers are the bombs that we say they are, then to complete the equation they must be provided with an activator of some sort also.



**By R. G. Eldridge, Boiler Inspector
City of San Jose
Bureau of Fire Prevention**

We believe and feel that many of you will agree with us, that it is entirely appropriate to refer to the lack of attention, the lack of maintenance, the lack of inspection, or any other cause that contributes to the detonation of them, as the fuse or activator of this particular type of bomb.

Now, if we will accept this thesis, then at this very moment, in large cities such as San Francisco or Los Angeles, there may be as many as three to five thousand of these bombs ticking away, just waiting for the opportunity to be detonated. Even in the smaller cities, such as our own San Jose, we estimate that we have well over a thousand, and we do not forget for a moment that these, too, are ticking away.

The boiler inspector, no matter if he works for the State, a municipality, or an insurance company, during his daily, routine inspections acts much like a bomb-disposal squad of the military, and is, in a true sense, actually "defusing" these bombs of unintentional destruction when, during the course of his inspection, he ferrets out and has corrected such things as stuck safety or relief valves, defective controls, improper installation, and many other potentially serious conditions.



Remnants of exploded fire tube boiler.



Boiler is identical to one which exploded.

In the further comparison of boiler inspectors and bomb-disposal squads, we find again an unusual parallel. First—both groups of men are specialists in their own fields, with many hours of academic and technical training and, in most instances, years of practical experience. Secondly—in both groups it is difficult to find anyone who takes a frivolous attitude toward the examination of the objects he inspects, or has less than the greatest respect for the tragedy that could be brought about by a mistake or poor judgment on his part.

When the low number of boiler explosions is compared to the large number of boilers in operation in a given year, the ratio becomes quite impressive and serves as a record we can all be proud of. However, some of these bombs are still getting by us. A case in point: in Sacramento, on March 2, 1966, in one of our larger motel restaurants, someone apparently failed to pull the fuse. The result: 2 men died, 7 were injured, and property damage amounted to tens of thousands of dollars. The assumed cause: over-pressure—low-pressure steam boiler—defective pressure control—faulty safety valve.

Again, in our own City of San Jose, on March 22, 1963, the sputtering fuse was allowed to reach the primer. This time 7 died, 80 were injured, damage was in the hundreds of thousands of dollars, indirect damage suits—millions. The probable cause: over-pressure—hot water heating boiler—faulty relief valve.

Even with disasters such as these, the overall record of boiler inspectors is good, but perhaps if we could educate the general public to look upon a boiler as exactly what it is—a water bomb capable of causing destruction equivalent to its TNT cousin, then perhaps a good record could be further improved and these disasters would be reduced to absolute minimum.

Owners of low-pressure boilers are urged to have them inspected regularly by competent inspectors. This is normally done by boiler insurance in-

spectors. The fact that such periodic inspections are not required by the California Division of Industrial Safety Orders does not mean that such inspections are not needed. The cities of Los Angeles, San Francisco and San Jose do require regular inspections of low-pressure boilers.

The *California Safety News* is interested in obtaining usable safety information, together with pertinent black-and-white glossy photographs. If you have an idea for safety, a safety record or a safety procedure that you believe may be of value to others, please send it in. The *California Safety News* does not pay for material, but may give it worldwide distribution.

Notice To Readers On Mailing List

State law requires that the mailing list for the *California Safety News* be verified annually and those who do not express the desire to remain on the list be dropped.

If you wish to continue receiving the *California Safety News*, please fill out and return the enclosed card at once.

Tailgate Topics

The Division of Industrial Safety has commenced the preparation and issuance of a series of brief articles entitled "Tailgate Topics." These articles are being distributed by Division Safety Engineers to employers to assist them in holding tailgate (or toolbox) safety meetings.

In order to make these available to as many employers as possible, it is planned to include them in future issues of the CSN. The first of the series was issued July 9th, and is reprinted below.

Anyone desiring to reproduce and distribute these articles, or any of our safety publications, may do so. It is requested that a credit line be given to the Division of Industrial Safety, State of California, and a copy of the reprint be sent us.

"Why Tailgate Safety"

Some of you are attending your first tailgate safety meeting and are probably wondering why this type of meeting is being conducted as compared to a standard meeting held in a conference room augmented by safety film, projector, and other safety props. It could be stated that the above en-

vironment is conducive to catnapping, whereas the tailgate meeting requires an upright position in an invigorating atmosphere. However, the real reason for tailgate or toolbox safety meetings is that the employer is interested in your well-being. He feels responsible to provide a safe working environment and a safe place to work.

By necessity, this group is limited in number which lends itself to a more personal contact with safety. You are involved directly and in a less formal manner. We can discuss safety from the standpoint of our particular job instead of subjects which you may not be particularly interested in. Each one of you, during the week, should be thinking about a particular phase of safety directly related to your work. Think about it during the week and then at some time during subsequent meetings be prepared to throw it to the group so that we can kick it around.

Before we start back to work today let us give thoughts toward safety in our jobs. Remember, working safely is like growing old—it's not so bad especially if you consider the alternative.

Methyl Bromide Torch, Refrigerator Leak Detector, or Halide Torch

A detector-type torch, known by any of the above names, has been in use for years. The torch is usually used for detecting chlorinated hydrocarbons and freons from leaky refrigerators. However, it is also widely used for detecting methyl bromide. Early models were alcohol fired; modern ones operate from a small propane tank.

Until recently, the torch had never been calibrated so as to correlate flame color with methyl bromide concentration. Using equipment available in the Division of Industrial Safety's Calibration Room, Walter Van Sandt, Associate Industrial Hygiene Engineer, prepared known concentrations of methyl bromide and determined the response of a Halide torch with the following results:

RESPONSE OF HALIDE TORCH TO METHYL BROMIDE

(Torch had a new copper button, or disc, operating at red heat.)

Parts Per Million Methyl Bromide	Color of Torch Flame
22	No color
44	No color
50	No color
60	Light green
66	Green
88	Green
110	Green
200	Green
330	Blue-green
500	Blue
1000	Blue

The threshold limit value (T.L.V.) of methyl bromide is C20 ppm (20 parts per million, which is a maximum concentration which is not to be exceeded even for short periods). Note that a torch will not detect less than 60 ppm which is 3 times the T.L.V. Also, note that if the flame is blue you are in a methyl bromide concentration which is immediately hazardous to life. A torch cannot be used to determine if the methyl bromide concentration in a workroom is 20 ppm or less.

The torch is useful for detecting leaks in fumigation systems or suspected sources of methyl bromide. To date, it is the only inexpensive device available for the detection of methyl bromide.

If you have a problem involving methyl bromide, contact the nearest office of the Division of Industrial Safety for assistance. The Division has instruments for measuring concentrations of methyl bromide far below those detectable by the torch.



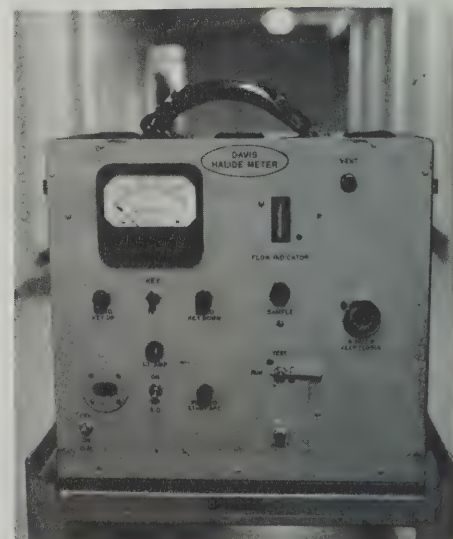
Old Style Methyl-Alcohol Fired Torch

If You Move—

If you move, and wish to continue receiving the CSN, please notify us of your new address.



Modern Propane-Fired Torch



Modified Davis Halide Meter used by the Division to detect very small concentrations of methyl bromide. (A Corning 7-54 Filter and platinum-stainless steel electrodes were installed.) The original research for the modification was carried out by industrial hygiene chemists at the Lawrence Radiation Laboratory.

Industrial Safety in the BART Project

By B. R. Stokes, General Manager, San Francisco Bay Area Rapid Transit District

During 1967, BART contractors—some 287 in all—recorded only 19 disabling injuries per million man-hours of work. This is dramatically lower than the national average of 46.04, and that record was achieved during an exposure of 7.5 million man-hours of work.

In this area of industrial safety, BART has no magic formula for success for the heavy construction industry is a breed unto itself, and the only formula for keeping accidents at a minimum is hard work through an education, indoctrination and counseling program.

We set forth on our program of industrial safety—one that would stretch through the seven years of construction on the BART project—back in 1963 when we entered into a contract with a consortium of insurance organizations whose headquarters are within the three counties encompassed by the BART network.

Known as Transit Insurance Administrators, or TIA, the group has established a separate insurance office to supervise all insurance for BART, including insurance engineering services, safety and fire protection.

At the outset of our construction phase, we considered the following factors of prime importance to the BART project:

1. A fast construction schedule.
2. The enormous number of workers required on the project in an extremely short time.
3. The variety of work hazards involved—including those encountered in marine work, tunneling and compressed air subway driving.
4. The necessity to have safety practices written into construction contracts.

In connection with the last point, our contract specifications provide that the contractor will, at all times, exercise reasonable precautions for the safety of his men in the performance of their work.

Each contractor, and we have nearly 290 on the project, was required to provide adequate facilities and equipment for first aid in case of



an accident, and we demanded that he have a standing arrangement for adequate medical care and hospital treatment for any person who became injured or ill.

Our safety in the BART project consists of BART management personnel and engineers, Parsons-Brinckerhoff-Tudor-Bechtel, Transit Insurance Administrators, our contractor forces and the joint insurers' safety engineering team. And it is through the teamwork of these five groups, with general safety measures overseen by TIA, that we have compiled our noteworthy safety record.

TIA and the joint insurers maintain a staff of six safety inspectors in the field at all times, and they are in constant touch with the resident engineers on each project. All facilities and arrangements for proper medical aid for injured persons on a particular contract must meet the particular specifications and be deemed adequate by the resident engineer.

Enforcement of the safety requirements of the specifications is through our regular line organization, with each resident engineer held accountable for the safety features of his project through his field engineers and inspectors.

Safety requirements are considered to have the same weight as requirements for quality of construction.

Each contractor, as earlier noted, is required to have a safety engineer on his staff to implement safety requirements, and he does so through

job superintendents, foremen and workmen.

Monthly meetings with top insurance management, the resident engineer, and each contractor are held to formulate policies, discuss weaknesses, review accident records and devise improvements. It is required that each contractor, the project manager, general superintendent, safety engineer and shift superintendents be in attendance at the meetings.

These meetings are followed by similar meetings at each job level with the resident engineers and their staffs and the job supervisors and foremen. Each project carries out its own program of safety education through meetings of foremen, lead men, and workmen.

Probably the most effective means of furthering the safety program are the short "tool box" meetings between the foremen and his crew which are held daily or as required to cover the particular hazards facing that particular crew.

Before beginning a job a new workman is given a list of safety rules for the project and an interview with a member of the contractor's safety organization, who discusses the particular hazards of the project. Such a program provides for a similar discussion with his immediate foreman. Screening of employees to prevent assignment of unfit to particularly hazardous work is accomplished at this time.

We received the cooperation of the unions in the early stages of our project in promoting safety education in their meetings and by having them assist with the safety indoctrination of new employees. Union stewards work with the engineers and contractors in policing safety regulations and devising safer methods and procedures. In addition, many meetings were held with the business agents of the various building trade crafts regarding safety ideas and their promotion among union members.

We at BART are pleased with our association with TIA, which followed

Continued on next page.

Continued from page 11.

our decision to utilize a single insurance carrier so that greater emphasis can be placed on safety engineering and accident prevention to minimize the number and severity of accidents.

We feel that a single insurer is more concerned with every phase of the work and his ability to have full-time safety engineers devoted exclusively to our construction project minimizes injuries and time loss. A single safety program for every aspect of BART construction is far more effective than a multiplicity of safety programs involving many insurers.

And our single-purpose insurance organization has paid off handsomely—in more ways than just in saved man-hours and the low number of injuries. Our estimated overall premium savings on the BART project from the inception of the program in July, 1964, to January 1, 1968, is in excess of \$2 million.

And our estimated workmen's compensation loss ratio as of September 30, 1967, is 38.08 percent, well below the contracting industry average of 56.89 percent.

Compressed Air Tunneling

Some 21 miles of the BART system will be subway, and of this subway portion six miles must be driven under compressed air.

In San Francisco, for instance, we are driving tunnels through a morass of earth fill and scuttled ships beneath Market Street where the water table is only 20 feet below the surface of the street.

To allow men and machines to work in such an environment, it is necessary to raise the air pressure as the tunnel proceeds to keep water from oozing in through the tunnel walls and flooding the shaft. Normal atmospheric pressure, or "free" air, is 14.6 pounds per square inch, and most of our tunneling will be under conditions where the air pressure is raised another 14.6 pounds.

Our insurance administrators researched all aspects of compressed air or pneumatic tunneling work throughout the United States, New Zealand, Scotland and Ireland before embarking on the program for BART.

Today at our Transit Compressed Air Medical Center in San Francisco, we are completely equipped to examine and re-examine the 900 so-called sandhogs we will need on the BART project, treat them for compressed air sickness in three specially built air locks, and oversee safety precautions at all compressed air tunneling projects throughout the BART system.

Our medical facility is staffed with a full time complement of 14 persons, supported by a medical director and his staff and the services of a separate medical clinic, with the entire facility overseen by Dr. Albert R. Behnke, foremost authority on compressed air illness, its symptoms, and its treatment. We are convinced a facility of this scope will be of inestimable value to the BART project in the realm of safety to tunnelers and reduced time loss on the project.

Our medical examinations for potential compressed air workers are stringent. In fact, most men over the age of 40 do not qualify for the work. They can have no history of respiratory or critical bone lesions, and their eventual medical clearance must be periodically updated through other equally stringent examinations.

We have notified nearly 300 law enforcement agencies, fire departments, hospitals, clinics, medical societies and ambulance services in the three-county district and surrounding areas about our compressed air workers, and have impressed upon these agencies the importance of returning a workman to our medical facility in San Francisco if the worker exhibits any symptoms of decompression sickness, such as staggering gait, dizziness, disorientation or incoherent speech.

And just so that our workers will arrive at our medical facility and not at the nearest drunk tank in a patrol wagon, each worker is equipped with a plastic laminated identification card with a colored photograph of himself and an aluminum disc hanging from a chain around his neck. These identify him as a compressed air worker and carry the address of the medical center.

Ambulance attendants have been given instructions for the care of pa-

tients with decompression illness while en route to the medical center.

The workers themselves are counseled frequently on symptoms of decompression illness, and must observe the necessary amount of time in the air lock before leaving the tunnel area, and are required to remain at the work site for a period of time after leaving the shift.

We already are at work under Mission Street in San Francisco, and our record has been gratifying in this unusual type of work. We feel that we will fulfill our three-point goal during the tunnel construction period of:

A. Minimizing or eliminating compressed air illness.

B. Eliminating the duplication of medical services and facilities.

C. Reducing insurance costs to BART in the form of increased workmen's compensation dividends because of good experience. Our immediate overall concern is the health and well-being of the worker.

Good accident records don't just happen, they are made to happen, by formal, aggressive, positive safety efforts by everyone—by owner, the engineer, the contractor, the insurance carrier, the governmental agency, the union, and the workman. No halfway measures can be fully effective.

It can be assumed, safely, we hope, that we can accept the fundamental fact that accidents are not inevitable or unavoidable. They are the result of human errors or defective material and equipment. They are wrong in principle because they cause pain, suffering and economic loss.

An accident prevention program is not something that can be established as a book of rules; rather, it is a concept of a great number of people working together for a common cause.

The Bay Area Rapid Transit District has an obligation to provide for the safety of the general public as well as the men and women engaged in the construction of BART facilities financed by public funds.

In the administration of construction contracts, we are attempting to meet this obligation by placing equal emphasis upon the quality of the system, its timely completion, and the safety of its construction progress.

California Division of Forestry Fire Academy

Each year the President of the United States proclaims the week containing the anniversary date (October 9) of the 1871 Chicago fire as "Fire Prevention Week." The bad summer of brush and forest fires got off to an early start in June, following a dry California spring, with fires in the Angeles National Forest, Los Padres National Forest, Yosemite, in Marin County, and several smaller grass and brush fires throughout the State. These all emphasize the need for the California Division of Forestry Fire Academy at Ione which was dedicated on March 8, 1968.

Your editor was privileged to visit the Academy in May and was quite impressed. He met a competent, enthusiastic staff who showed him modern buildings, modestly equipped to house 48 students; classrooms which would do credit to a miniature college, and a five-week curriculum of intensive instruction, including actual fire fighting and operation of heavy equipment. He saw small buildings designed for training men to fight structural fires; these are set afire many times before becoming unusable. The layout of heavy equipment training grounds on 200 acres of government property was designed to

provide ease of coordination of equipment, avoiding interference of one unit with another. The equipment is not assigned permanently to the Fire Academy but is borrowed from other districts of the Division of Forestry; it is used in fighting fires during summer fire seasons.

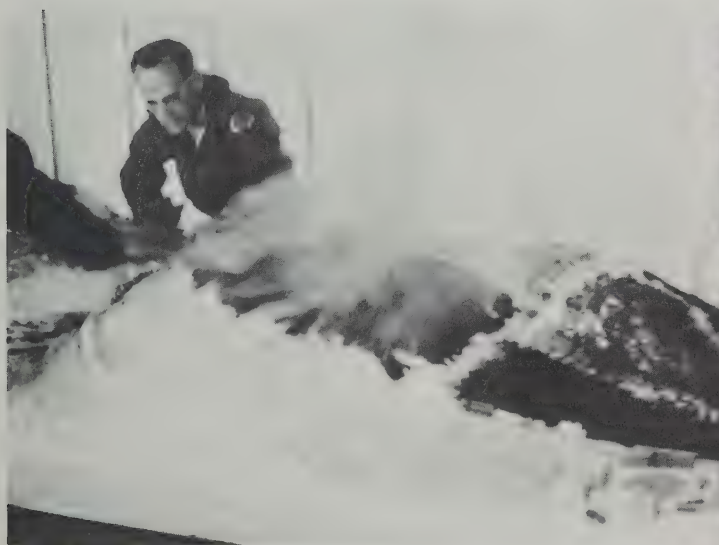
A most useful training device is a sand table built to scale representing mountainous terrain. Heavy equipment is represented by toy trucks, bulldozers, road scrapers, pumper trucks, personnel carriers and fire trucks. The model is covered with sawdust and saltpeter enabling the instructor to set it afire. A hair drier is used to create the hot winds encountered in fire storms. With knowledge of how much equipment is available, its location, how long it would take to get it in position, how fast fire breaks can be built, the effect of borate bombing on fires, and other factors, men are trained to coordinate fighting of fires at little cost or hazard. There is nothing that will better give a man confidence in his ability to do a job than actually doing that job. So the foresters get actual experience in operating and maintaining the equipment, and are graded on their fighting

of actual fires of all types, including structural, oil, and automobile, as well as forest and brush fires.

For 5 weeks the men receive intensive instruction in 52 subjects, such as fire-truck pump operation, truck fire equipment, hydraulics, hose laying, how to use water correctly, use of chemicals and explosives, communications, map reading, and special training on how to drive heavy equipment in boulders, sand traps and brush. The Division of Industrial Safety furnishes Safety Engineers to instruct in the safe use of explosives and other safety matters.

The Division of Forestry is responsible for more than half the area of the State. For economy and effectiveness, it contracts with many local agencies to care for some of the areas. An average year will have more than 13,000 fires, each a possible disaster. It appears that this year will be worse than average.

The fires these men fight this year will provide "graduation exercises" costing Californians millions; they may cost some of these men their lives. But without the training these foresters are receiving, the cost and lives lost would be immeasurably higher.



Sand table provides valuable experience in coordinating fire fighting without danger to men or equipment.



Group receiving instruction on fire truck equipment.

Trucking Dangerous Commodities

Recently, a Division Safety Engineer received a worried telephone call from a plant safety engineer. Inside a closed, van-type truck, the plant safety engineer had noticed a number of drums marked "parathion." Stacked on the tops of the drums he saw cartons of ice cream cones. His concern was valid—as evidenced by the tragic experience in Mexico some months ago when many people died as the result of eating parathion contaminated food.

The call was enough to set off an instant reaction. Our Safety Engineer telephoned his Senior Safety Engineer, who immediately called the trucking firm. The firm intercepted the truck by an emergency radio message before the cones could be delivered and ordered the driver to return. The truck was impounded and the ice cream cones quarantined by the local Health Department for laboratory tests.

The tests showed that at least 4 of the 34 packing cases containing the ice cream cones were contaminated. The entire shipment was destroyed and the truck decontaminated.

We congratulate the plant safety engineer who called the hazardous situation to our attention.

California has reasonable safety regulations which, if followed, would have prevented such a situation. The Department of California Highway Patrol requires that a driver upon picking up a shipment and noticing a dangerous article or a Danger label,

ascertain that the shipping documents describe the material and how it should be handled. Also if shipping documents indicate a hazardous commodity, the containers must be properly labeled. Companies are required to keep their drivers informed as to what types of dangerous articles are incompatible and what other commodities may not be loaded with them. Companies must instruct their drivers to keep shipping instructions and descriptions of the commodity in their possession at all times the hazardous commodities are aboard. This applies to every carrier handling the shipment or any portion of it.

Section 177.841(e) of the *Motor Carriers' Explosives and Dangerous Articles Tariff* reads as follows:

Poisonous liquids or solids, class B, must not be transported in the same vehicle with any foodstuffs, feeds, or any other material intended for consumption by humans or animals which are not packaged in air tight nonpermeable containers.

Section 4146 of the *California General Industry Safety Orders* requires portable containers in which poisonous substances are used, stored or transported, to be marked. It provides for protection of employees and requires employees who may be exposed to poisonous substances to be advised of the hazards they may encounter and of methods of protecting themselves against injury by such substances.

E. V. Muller Retires



Mr. and Mrs. Muller at luncheon honoring him.

On June 21, 1968, over 80 friends gathered at a luncheon in Los Angeles to wish Senior Safety Engineer, Edward V. Muller, good luck and good health on his retirement after 24 years of dedicated State service. His charming wife, Edith, shared in his tribute as she had shared in his tribulations.

Mr. Muller was presented a portable television set and a guest signature book as a token of the appreciation of his fellow employees.

McKay Mitchell Honored



In recognition of employment with the State of California for a period of 25 years, a certificate for faithful public service, awarded by the Governor, and a pin was presented to McKay Mitchell (left), Senior Safety Engineer, Division of Industrial Safety, by Jack F. Hatton, Chief of the Division. The presentation was made on June 21, 1968.

CONSTRUCTION FATALITIES BY INDUSTRY

First Four Months, 1967 and 1968

	First 4 months 1968	First 4 months 1967
Total	36	47
General building contractors and operative builders	6	6
General contractors other than building	16	26
Highway and street	6	2
Tunnel	3	—
Sewer, pipeline, other trench	3	10
Other heavy construction	4	14
Special trade contractors	11	15
Structural steel erection	1	5
Plumbing, heating, air conditioning, sheet metal	3	3
Painting and paperhanging	1	2
Electrical	3	1
Masonry, stonework, plastering, etc.	—	2
Carpentering and floor laying	—	1
Roofing	1	1
Water well drilling	1	—
Glazing	1	—
Other special trade contractors	3	—

Report prepared by Division of Labor Statistics and Research.

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Christmas Tree Safety

Note: This article is included in this issue in order to provide ample time to prepare for the forthcoming Christmas season.

Particular attention is called to the section entitled "Flame-Proofing the Tree."

The Christmas tree, symbol of the holidays, is used as the central decoration not only of most homes but of many offices and institutions. A review of the hazards and precautions may help to keep your holiday season a happy one.

Selecting the Tree

Remember that the larger the tree, the greater the potential fire hazard, so don't get one larger than you need. Select it carefully, making sure that it is not dry; branches should bend without breaking and needles should not fall when branches are shaken.

Storing the Tree

Saw off the trunk at an angle of 45° at least one inch above original cut and immerse trunk in water. Store tree in a cool place until it is to be decorated. Plan the decorating so that the tree will be indoors as short a time as possible.

Flame-Proofing the Tree

Trees, as well as other decorations used in public places where more than ten people are expected to assemble, are required to be of nonflammable material, or to be treated so as to be flame-retardant and maintained in that condition. To be certain of an effective job, use a product on the State Fire Marshal's approved list, which is available from his offices.

Chemicals must dry on the surface of the tree. Solutions which depend on absorption through the trunk are useless since the tree will not absorb them; nor are solutions of chemicals dissolved in water effective, such as borax and boric acid, diammonium phosphate, or ammonium sulphate.

Flame-retardant Christmas trees are available in many areas of the State, and these provide increased safety. Such trees should show on a tag, date of treatment, name of applicator and name and registration number of chemicals used.

Mounting and Location

In setting up the tree indoors, stand it in water or wet sand and brace or wire the tree securely in position. Since it evaporates, add to the water now and then; this will prolong the life of the tree.

Locate the tree away from radiators, heaters, T.V. sets and especially the fireplace. Select a spot that is as cool as practical and where no exit or stairway will be obstructed. Keep it away from curtains or drapes.

Decorations

Several types of simulated snow, known as "flocking" qualify as being fire-resistive, but flocking alone will not make a tree flame-retardant. Hence it should be applied only after the tree has been treated with an approved flame-retardant chemical. Ornaments and decorations should be nonflammable. Do not use flammable material such as cotton, paper, etc., on the tree or at its base. Lighted wax candles should never be used on or near the tree. Use a stepladder, not a box or chair, to decorate a tall tree.

Electrical Safety

Examine light cords and make sure they are in good condition with no frayed wires, loose connections or broken sockets. Sets of cords having built-in fuses are recommended.

Do not plug too many cords into one outlet. Connect lights to an outlet not under the tree. It's a good idea to provide a switch away from the tree for turning lights on and off.

Make sure no metal foil or tinsel touches a light or socket. Never string electric lights on trees made of aluminum or other metal. Such trees are good conductors and can become charged. Use off-tree spotlighting for such trees.

If extensive lighting decoration is to be installed, call in a competent electrician. For decorating an outdoor tree, use lights designed for outdoor use; point sockets downward so they won't catch water or snow.

Common Sense Suggestions

Do not leave children or pets alone in a room with tree lights on; make it a practice to turn them off when leaving the room.

Do not let Christmas wrappings accumulate; provide containers and get rid of them as soon as possible.

In general do not allow smoking near the tree, and particularly while dismantling it, do not smoke. Keep matches, lighters and candles out of reach of children.

Keep a water-type fire extinguisher, bucket or water or a hose connected to a faucet where you can get it to the tree easily.

If using a plastic tree, be sure it is approved as flame-resistant. In case of doubt make a simple test by burning a small segment in a safe place.

It is recommended that the tree be removed as soon as practical after Christmas. It should be discarded before needles fall or separate easily from the branches.

If there should be a fire, first get everyone outside. Next, call the fire department; then make use of your own fire-fighting equipment.

Happiness Is

Roll Bars and Seat Belts

A Euclid earthmover rolled over. It was not equipped with roll bars or seat belts. The operator had to jump for his life—he made it!

Later, on the same job, a tractor equipped with roll bars and seat belts rolled over twice sideways, then flipped about three-quarters over and came to rest on its side, approximately fifty feet down an embankment.

Damage to the tractor included a bent hydraulic ram which was replaced, a bent right arm on the dozer blade which was straightened, and a bent stack which was straightened by hand. The roll bars were not damaged. The seat belts were replaced with better ones, of an approved type, even though they did what they were supposed to do. The operator rode it out and received only a minor scratch.

SAFETY ORDERS

Safety Orders are sold by STATE OF CALIFORNIA, P.O. Box 20191, Sacramento 95820. Check or money order, including 5 percent sales tax for California address, must accompany orders. There is a 10 percent discount on orders of 50 or more of same title. Bracketed year is latest date of revision and/or amendment.

	<i>Price</i>	<i>With Sales Tax</i>
Aerial Passenger Tramway Safety Orders (1956)	\$0.75	\$0.79
Boiler and Fired Pressure Vessel Safety Orders (1968)75	.79
California Shaft Bell Signals (printed on oilcloth)	1.50	1.58
Compressed Air Safety Orders (1966)75	.79
Construction Safety Orders (1965)	2.00	2.10
Elevator Safety Orders (1968)	1.50	1.58
General Industry Safety Orders (1968)	1.50	1.58
Logging and Sawmill Safety Orders (1958)	1.50	1.58
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Chapter 4 of Title 8, including all Safety Orders	16.00	16.80

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CALIFORNIA'S \$3.9 BILLION INDUSTRY

Vol. 52, No. 2

June 1968

ONE MILLION MANHOURS WITHOUT LOST-TIME ACCIDENT CAMPBELL SOUP CO. HONORED



L. R. Schafer, plant manager (left) being presented award by Jack F. Hatton, Chief of the Division of Industrial Safety (center), as W. S. Tickle, master of ceremonies, looks on.

The Campbell Soup Company plant at Modesto worked 239 days for a million manhours without a lost-time accident. The Greater Modesto Safety Council marked the event with a luncheon at the Sandpiper Restaurant on April 8th honoring the company and awarding a plaque as a permanent record of this achievement in safe operations. Jack F. Hatton was the principal speaker and made the presentation.

"Bill" Tickle, Safety Engineer, Division of Industrial Safety, commented that the million manhours without accident was "no accident" but the result of combined efforts of Paul Weborg, business representative of the Butchers Union, and his stewards; the General Plant Safety Committee composed of the plant manager and his departmental managers; the Engineering and Maintenance Department headed by James Caylor, and the Division of Industrial Safety Engineers.

In accepting the award, Mr. Schafer introduced and personally thanked employees who were instrumental in achieving this outstanding safety record.

The appreciation of members of the Greater Modesto Safety Council was indicated by a record attendance.

Antioch Fibreboard Awarded Governor's Trophy

Fibreboard's boardmill and carton plant in Antioch was awarded the Governor's Trophy for safety for the lowest injury rate (1.97) in the California pulp and paper industry for 1967.

San Gabriel Valley Chapter GISC Presents Safety Awards

The San Gabriel Valley Chapter, Governor's Industrial Safety Conference presented plaques commemorating safe operating records established by:

Aerojet General Corporation, Electronics Division, Azusa, for working over 3 million accident-free manhours;

Honeywell Regulator, California Ordnance Center, West Covina, for over 2 million accident-free manhours, and

Avery Adhesive Products, Monrovia, for over 1 million accident-free manhours.

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The California Safety News is mailed free of charge to those interested in industrial safety.

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Cover photos courtesy of
California Farm Bureau

"TREAT HER LIKE A LADY"

By John W. Myers, Safety Engineer
Division of Industrial Safety

There are fewer than 6000 commercial dairies in California, having a total of about 850,000 milk cows. These dairies employ about 12,000 people to perform such tasks as milking, care of animals, maintenance, crop harvesting, and other jobs associated with the dairy industry.

Dairies reported 4900 lost-time accidents between 1962 and 1966, of which 24 were fatal. This averages about 1000 accidents and 5 fatalities per year. The cost of these accidents to the dairy industry amounted to approximately \$1,000,000 in 1966. This sum could buy a 100-acre dairy, including modern barns and equipment, living quarters and a herd of 500 cows. The majority of accidents occurred when an employee was kicked. The injury is usually severe, with one out of five resulting in a fracture to some part of the face, body or limbs of the milker.

Handling of Animals

Some employees treat an animal as if it were a machine, forgetting that a cow is a large, powerful creature that can strike a smashing blow or deliver a crushing body attack without warning.

Animal handlers who have worked without having been kicked or attacked stated that a pet relationship can be developed. One milker aptly described this attitude with the statement, "Treat her like a lady." In his opinion this pet-type relationship should be developed so the cow will know she will never be harmed. For this reason, inoculations or medical treatment which might be painful should *never* be performed in the milk barn but rather in another building or location. An animal that has been hurt by a human being will be on guard and will attempt to protect itself until this fear has been removed. This may take several days or much longer.

During the months of October through March accidents to employees from kicks are the most frequent. Since these are the months of cold and rainy weather, corrals and feed lots become cold, wet and



muddy. This can cause the cow's udder to become cracked and sore. Milkers should use caution when attaching the cup and claw assembly when a cow has an injured or sore udder for she is then very prone to kick, and many accidents happen at that time.

Eye injuries occur frequently during the fly season, when the cow's swishing tail strikes the milker in the face. The tail hairs can be dragged across the eyeball, and since these hairs are rough and strong, a permanent scar can result. In a recent accident a milker received a serious, permanent injury of one eye when red-hot ash from a cigarette he was smoking was brushed into his eye by the swing of a cow's tail.

How can such eye injuries, caused by being struck by a cow's tail, be prevented? The practical solution is to wear some type of eye protection. Some milkers consider this to be ridiculous, in a dairy. The fact is that milkers who wear glasses because of defective vision have not suffered eye injuries when they have been struck by the animal's tail. From their experience, it can be deduced that a simple type of device will provide adequate protection.

Another animal inhabitant of some dairies is the bull. These large beasts can be extremely dangerous, and several employees have been fatally injured in the last few years. Handlers should never enter the bull's corral on foot unless the bull is secured.

Accidents in the Milking Barns

Presently there are four basic types of milk barns: the conventional, the walk-through, the parlor, and the herringbone.



Floor Level Type Barn



Walk-Through Barn



Breezeway in Walk-Through Barn

Continued on page 4

Continued from page 3

The conventional type is a floor-level barn, constructed to accommodate 12 to 60 cows. This type of barn is one of the most hazardous for the milker because he must work behind and beside the cows. He is exposed to kicks, trampling hoofs and crushing between the cows or a cow and the barn walls.

In elevated parlor barns, the milker is removed from the work area among cows by lowering him into a pit, or by raising the cows to a fixed ramp. These types of barns reduce injuries to the milker from kicks and crushing, and in the parlor type barn, if the protective bars are kept in place, these injuries are practically eliminated.



Parlor Type Barn

This picture shows a parlor type barn without the protective bars across the milking access opening. Milkers have received serious face injuries, including fractures of the nose and jaw, when cows have kicked through these unguarded openings. Some dairymen report that it is difficult for the milker to attach the cup and claw assembly. Some complain that the protective bars are "just in the way." But dairymen who require that protective bars be in place during milking do not believe that the bars impair milking time and they do reduce injuries.

Field and Feeding Equipment

Many dairies grow and harvest their own feed crops. This requires the use of various machines, performing such operations as: mowing, windrowing, chopping, baling, bale-pickup and stacking, and feed distributing. Each machine in this group has caused serious and fatal injuries to dairy employees. Many tragic accidents happen when employees attempt to repair, adjust or clean a machine while the motor is running or while it is in motion. Whenever such a machine is to be cleaned, repaired or adjusted, the power should be positively disconnected. This means stopping the power source (engine) and making sure that all parts of the machine are at rest.

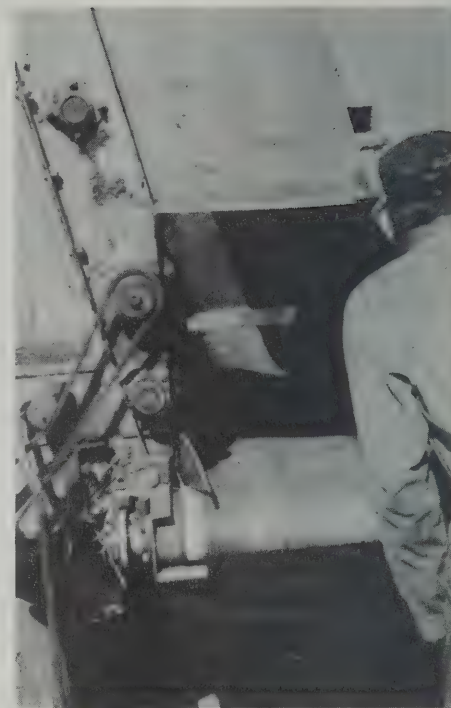
Feed wagons, in use on many dairies, have caused numerous serious accidents. Each year fingers are amputated when caught in the chain and sprocket drives.



Herringbone Type Barn



Note Lack of Bars

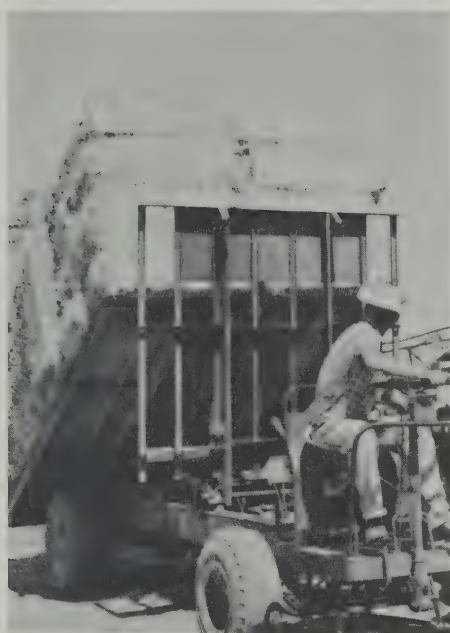


Note Unguarded Chain and Sprocket

Chain and sprocket drive guards should be maintained in place whenever machines are in operation. Exposed power take-off shafts have caused loss of legs, and even fatal injuries. Power take-off shafts should be enclosed in a shield or casing that will not rotate with the shaft.



An Effective Guard



Automatic Bale Wagon

The automatic bale wagon has proved to be a very useful, time-saving machine. The operating instructions provided with these machines must, however, be carefully followed to avoid accidents. A number of fatal accidents have occurred through their use. In most cases the operators were crushed or impaled under the first "table" while they were trying to adjust the table control device while the engine was running. Usually, the employee entered the danger zone under the partially raised table; then, as he tripped the control device, the table moved downward quickly and trapped him. The safety devices provided by and available from the manufacturer should be installed and kept in place at all times.

Miscellaneous Hazards

Frequently employees fall from hay stacks and sustain serious injuries. Hooking bale wires with hooks should be prohibited; also workers should be instructed to never pull bales with their backs towards the edge of the stack as this could cause them to fall.

Forks and hay hooks must be safely stored when not in use.

Conclusion

Visits to dairies and discussions of accident prevention with dairymen in-

dicating they are very concerned about the rising accident rate, with its proportional increase in insurance costs. Many are of the opinion that the industry as a whole must place greater emphasis on safety, and commence industry-wide corrective measures. The accident rate in the dairy industry can be substantially decreased by proper barn layout, training, and closer supervision of employees.

Studies have shown that in general, the milk barn is an area having a high accident rate, and that with a little attention, unsafe conditions can be eliminated, resulting in a definite reduction in accidents. The fact that injuries, due to kicking, are greatly reduced in parlor and herringbone barns, where the milker is not among the cows, warrants strong consideration on the part of a dairyman who may be remodeling or redesigning his milk barn.

Training should not only be given to all new employees but also to experienced ones, whenever it seems to be needed. This training should include the handling of animals, machine operation and general safe practices.

Supervisory personnel are the key to safe operations. They usually assign the work tasks and observe the employees' work habits and abilities. If a worker is not performing his job correctly, the supervisor (foreman) should make sure that he does so; any unsafe practices should be corrected immediately. On ranches, large or small, where training programs have been instituted which require foremen to correct unsafe conditions or acts, only a few accidents have occurred—and accident rates have decreased steadily.

Deere Donates Safety

The John Deere & Company, in cooperation with its dealers, conducted a safety program that cost more than \$500,000 to encourage farmers to use roll bar protective frames on their tractors.

The program was conducted throughout the United States and

Canada during January and February. Information leaflets were sent by first-class mail to one and one-half million farmers explaining how the protective frame was developed and what it provides in protection. Then, in connection with the showing of John Deere "Farming Frontier" movies, in each of about 3000 farming communities the local John Deere dealer held a drawing and the winning farmer received a "Roll-Gard" protective frame.

Through this means of assuring there would be at least one tractor with roll bar protection operating in every farming community, the company hoped to call the safety frames to the attention of many farmers and create interest in equipping their tractors with the frames.

Safety Clubs Halfway-to-Hell Club

In the March issue of CSN we described three safety clubs and urged employers to obtain membership for eligible employees.

A fourth club is the Halfway-to-Hell Club, composed of workers whose lives were saved due to their being caught in a safety net when they fell.

For membership applications and information, write to the sponsor, Eric L. Pedley, Pedley-Knowles & Company, 533 Second Street, San Francisco 94107.

Misuse Of Irrigation Pipe

A recent death tragically emphasizes the need to use equipment properly. An 8-inch diameter aluminum irrigation pipe was substituted for a proper pipe to carry air for a concrete chipping gun operation. Although the pipe held the static pressure for the gun, it failed when the gun was started. When the pipe ruptured, the adapter fitting blew off, injuring one worker and causing the death of another.

Irrigation pipe should only be used for water and then only within the maximum pressure, as recommended by the manufacturer.

WATCH OUT FOR LEAD POISONING!

The 55-year-old man was critically ill, but it never occurred to him that a cup made by his son as a gift was the cause. The patient, himself a doctor, suffered from generalized fatigue, a feeling of heaviness in his arms, insomnia, headaches, lack of appetite, nausea, and occasional loose stools. He lost 10 pounds in a single month. His crampy abdominal pains had lasted several weeks before he entered the hospital. A week of testing disclosed that the patient was suffering from lead poisoning so severe that even after two weeks of hospitalization, with presumed total absence from exposure to source, the level of lead in the blood remained dangerously high. It took three months of therapy with a calcium compound to get the concentration of lead out of the urine and blood.

That out of the way, the hunt was on for the cause. The *Journal of the American Medical Association* (November 6, 1967) reports that questioning at first seemed futile, "but the patient's wife soon offered a key clue to the mystery. It seems that the patient had the unique habit of filling a ceramic mug, made by his son, with ice and a soft drink. He sipped the chilled soda during a period of several hours in the evening, usually refilling the mug with a second bottle of cola. This had been an almost nightly ritual for the two years preceding his admission to the hospital." The mug was examined at a laboratory, and tests showed that over 5 milligrams of lead were leached from the mug for every 450 cubic centimeters of cola within half an hour.

Robert W. Harris, M.D., and William R. Elsea, M.D., described the mug as a yellow ceramic, with a smooth glazed outer finish, and the inside quite faded and chalky. When Harris and Elsea filled the cup with cola, there was a rapid appearance of lead in the soft drink. This did not happen when the cup was filled with water. The acidity of the soft drink reacted with the lining of the cup and released the lead.

Lead Glazes Dangerous

The doctor's son had enrolled in a ceramics class at college and molded several mugs identical to the one he gave his father. His was one of the few classes to use lead oxide as a glazing agent. The students were told about the dangers of handling lead glazes, but nobody was concerned about the actual use of the articles.

When the authors reviewed the literature on lead poisoning, it became evident that this situation was not unusual. Numerous experiences with acidic food and drink and lead-glazed utensils were noted in the past, at least as far back as the Roman Empire. And as recently as 1967, a gastrointestinal epidemic in Mexico was blamed on poorly fired, lead-glazed earthenware. The JAMA story warns that "the popularity of ceramics as an art and hobby, and paucity of governmental regulations would seem certainly to offer a potentially dangerous situation, considering that the ceramics industry uses 25,000 to 30,000 tons of lead a year."

Lead poisoning from cooking and eating utensils is just one of our dangerous exposures to this metal. We are literally being bombarded by lead in the air from automobile exhausts. Tests of our ocean waters show about 50 times more lead present now than before automobiles were common. *Science Newsletter* (December 28, 1963) reported 10,000 times more lead in snow samples from California's Lassen Volcanic National Park than would be expected to accumulate from normal soil sources. Vegetables and fruits grown along our super highways contain 50 times more lead than the amount considered tolerable in foods.

We can absorb lead in any of three ways—the digestive system, the respiratory system and the skin. We get it mostly through the digestive system, since lead is in so many of our foods.

The lead is circulated in the blood stream and much of it is deposited in the bones. If the capillary walls which protect the brain and spinal cord are damaged the lead can affect those organs also. Victims appear pale and anemic and feel a gradual weakness, with increasing abdominal pains which develop into the notorious "lead colic." Unfortunately, many of the symptoms of lead poisoning are common to other ailments, making diagnosis difficult.

Lead Gets to the Nerves

Chronic lead poisoning is known to affect the central nervous system. This prompted Professor Harry V. Warren, geologist at the University of British Columbia, to suggest in 1963 that lead poisoning might be related to diseases of the central nervous system, particularly multiple sclerosis. His studies of 24 localities having a high incidence of MS showed that in every case the rocks and soils of the area were relatively high in lead. Where there was less multiple sclerosis, the average lead content of surrounding rocks and soil was also lower. It is undeniable that MS symptoms show many similarities to chronic lead poisoning—weakness, paralysis, visual and auditory disturbances and emotional changes.

Biochemically lead reacts much like calcium. When both lead and calcium are present the bones are more likely to take up the lead, because the lead compounds are less soluble than the corresponding calcium phosphates. But if supplementary calcium is given before the lead, less lead is taken up by the bones and more goes to the stomach, on its way to being excreted. This finding suggests that a high calcium (bone meal) diet should work to prevent excessive lead absorption. Presumably this is the basis for the therapy used on Harris' and Elsea's patient.

Anti-Lead Vitamins

Japanese researcher Giro Obara reports in the *Tohoku Journal of Experimental Medicine* (46:1944) that acute tetraethyl lead poisoning brings

on more mental effects than does poisoning from inorganic lead, perhaps because of its more rapid absorption by the body. Vitamin B₁ and sodium thiosulfate help to alleviate the poisoning symptoms. But larger doses of vitamin C have the greatest effect as an antidote, says Obara. Tests show that the poisoning reduces the liver's ability to form new glycogen from added glucose. But vitamin B₁, vitamin C and sodium thiosulfate all help to neutralize that effect.

Howard R. Lewis, in his book *With Every Breath You Take* (1965), called lead the most common toxic metal, responsible for the larger portion of accidental poisoning incidents. He describes a recent Chicago study which revealed lead poisoning as the cause of 79 percent of all accidental deaths there. We are all exposed to lead from many sources, taking in an average of .37 milligrams a day, uncomfortably close to the .50 milligrams considered the maximum non-toxic dose. Since there is evidence that the B vitamins, vitamin C and calcium are protective against lead poisoning, it makes good sense to get plenty of these nutrients every day.

From "Prevention," March 1968

Warning

The Food and Drug Administration has issued warnings that three spray-type oven cleaners may cause explosions when used on hot surfaces or near a pilot light.

They are Aerosol Super Foam oven cleaner with ammonia, made by the Aerosol Corp. of Camp Hill, Pa.; Heavy Duty Cookware Cleaner and Heavy Duty Oven Cleaner, both sold by the Sunbeam Appliance Co. of Chicago.

The FDA said the cleaners contained propane gas, which is explosive. All the products are being recalled from the market, but some cans were still in stores or homes. It said seven instances of fire had been attributed to the cleaners.

From *The Michigan Mutual Shop Man*,
September 1967

Let's Stop Stake-Pounding Injuries

By John O. Kinert, Safety Engineer
Division of Industrial Safety



Numerous hand and arm injuries from splinters of redwood stakes, or from broken ones, used to support tomatoes and other row crops can and should be prevented. Mr. L. W. Mullaney, Safety Engineer with the Division of Industrial Safety, started promoting the use of a simple, inexpensive guard for tube-type stake pounders in 1964. The guard was originated by a South Bay grower.

The guard consists of a flange, cut from a piece of steel plate, welded around the open end (bottom) of the tube. The flange deflects or prevents splinters or ends of broken stakes from striking the operator's hands or arms. A commercial screw-type flange is not used because these have bolt holes, which might permit slivers to strike the operator's hands; furthermore, the tube (pipe) would have to be threaded.

The writer investigated six injuries from splinters or broken stakes during the summer of 1967. These were all in San Diego County, formerly served by Mr. Mullaney. In none of these was the stake pounder guarded. We do not know of any injury of this type occurring where guarded stake pounders were used. This is most significant.

It is hoped that the growers of row crops who have not already guarded their stake pounders will do so before more splinters can take their toll.



Note Flange and Cap

Construction Company Fined For Safety Order Violation

Andrew Papac, President of Papac Construction Company, Inc., was fined \$500, and placed on three years summary probation by Judge Warren L. Ettinger, Municipal Court of Pasadena, March 25, 1968. In addition, the Papac Construction Company was fined \$500.

The case involved violation of the State Labor Code and Construction Safety Orders, resulting in the death of Raul Munoz while he was working on a Sierra Madre sewer project.

Munoz was working at the bottom of a shaft 17 feet deep. This shaft, less than four feet from an existing 8' x 8' concrete box storm drain, was being used in connection with the excavation of a short tunnel. No shoring of any kind was used in the shaft, tunnel or in an adjacent trench of the same depth.

The undermined section of the shaft adjacent to the box collapsed and buried the workman with about six feet of sand and dirt. He died before he could be uncovered.

Andrew Papac, President of the company, entered a plea of *nolo contendere* to the violation of Construction Safety Order No. 1542.

Secretary of Labor Willard Wirtz has issued an interim Hazardous Occupations Order to protect paid farmworkers under 16 years of age from the particularly severe hazards associated with certain farm jobs. The order does not apply to youth employed on a farm owned and/or operated by their parents or persons standing in for parents. Students in vocational education programs are exempted from the order, and other farm-training and education programs may be exempted upon application.

The order prohibits the use of hired workers under 16 to do any of the following: handle or use explosives or certain farm chemicals; serve as flagman for aircraft; drive vehicles on public roads, or drive buses; operate, drive, or ride large tractors or hook up their power accessories with motor running; do certain jobs on specified farm tilling, handling, harvesting, and processing equipment; operate power post-hole diggers and post drivers; work with power saws; engage in timbering operations on trees over a 6-inch diameter; work from ladders or scaffolds at more than 20 feet; work in certain gas-tight enclosures; or in silos with top unloaders in operating position; and work in confined areas with dairy bulls, boars, and stud horses.

The Hazardous Occupations Order for Agriculture took effect on January 1, 1968. Its operation will be reviewed during the following 2 years to determine its effectiveness in the light of growing experience.

The new order was issued under the authority imposed on the Secretary by Congress in the 1966 amendments to the Fair Labor Standards Act. In a statement accompanying the order, Mr. Wirtz said: "According to National Safety Council figures the death rate for agricultural workers is exceeded only by those for miners and construction workers. The agricultural revolution of the past 30 years has mechanized the farm and increased the use of chemicals. Today the farm has (as) many, if not more, hazards than industry. Best estimates indicate that there are about 800,000 paid farmworkers under 16. This group comprises about one-fourth of

the total farmwork force. Young workers are not immune to accidents. A recent Department of Labor study covering only seven states, and incomplete even in those seven, showed nearly 4,000 injuries in 2 years to farmworkers 10 to 17 years of age."

The order was prepared in consultation with farm organizations, farm business groups, farm safety experts, Federal and State Government agencies, and agricultural colleges. The list of occupations thought particularly hazardous was circulated to some 200 persons and organizations for review and comment. The replies were useful in preparing a proposed order, which was published in the Federal Register, April 18, 1967. A public hearing on the order was held on May 18. Following evaluation of the comments made and presented in writing at this hearing, the interim order was promulgated in the Federal Register on November 7, 1967.

Assistant Secretary Esther Peterson, in a press conference announcing the order, explained that the agriculture order and certain changes in Hazardous Occupations Orders Nos. 2 and 7, and in Child Labor Regulation No. 3, indicate two major concerns of the Government: the need, first, to keep safeguards abreast of current technology; and second, to "allow good and fruitful work experiences for our youth."

In releasing the order, Secretary Wirtz explained the rationale for the various sections as follows: (Prohibited employments in italics).

1. *Handling or applying anhydrous ammonia, organic arsenic herbicides, organic phosphate pesticides, halogenated hydrocarbon pesticides, or heavy-metal fungicides, including cleaning or decontaminating equipment used in application or mixing of such chemicals.*

Of the many agricultural chemicals used on farms, only those presenting serious health hazards are prohibited. Anhydrous ammonia has a corrosive effect on body tissues. The pesticides prohibited either affect the central nervous system, causing respiratory failure, or may cause death by the

accumulation of even minute quantities over a prolonged period.

Persons under 16 may still handle and apply other types of fertilizers and less toxic agricultural chemicals.

2. *Handling or using a blasting agent. The term "blasting agent" shall include explosives such as, but not limited to, dynamite, black powder, sensitized ammonium nitrate, blasting caps, and primer cord.*

The use of blasting agents requires experience and expertise. Mishandling can result in accidental detonation, and maiming or loss of life.

3. *Serving as flagman for aircraft.*

The job of flagman for aircraft is hazardous because the flagman stands in the line of flight to direct the pilot and also because of the possibility of contamination from the chemical being applied.

4. *Working as—*

a. *Driver of a truck or automobile on a public road or highway.*

b. *Driver of a bus.*

Exposure to other traffic while moving at considerable speed makes driving a motor vehicle on a public road or highway hazardous. The additional responsibility of carrying passengers makes driving a bus unsuitable for youth under 16. They may drive a truck or automobile on the farm itself.

5. *Operating, driving, or riding on a tractor (track or wheel) over 20-horsepower or attaching or detaching an implement or power-take-off unit to or from such tractor while the motor is running.*

Farm tractors overturn easily and the operator or passenger may be seriously injured. Serious injuries are complicated if the accident occurs in an isolated area and is not discovered quickly.

The rotating drive mechanisms of implements or power-take-off drives inflict serious injuries if parts of the body or clothing come in contact with the exposed drive shaft or moving parts.

Persons under 16 may still operate garden-type tractors, which are free from the extensive hazards associated with large, heavy-duty equipment.

Y ORDER FOR AGRICULTURE

6. *Operating or riding on a self-unloading bunk feeder wagon, a self-unloading bunk feeder trailer, a self-unloading forage box wagon, a self-unloading forage box trailer, a self-unloading auger wagon, or a self-unloading auger trailer.*

These wagons and trailers are normally towed by farm tractors and usually powered by the power-take-off from the tractor. The series of gears, revolving shafts, driving chains, augers, and conveyors used to unload the ensilage or roughage can inflict severe injuries. The power-take-off itself is another hazard, since the operating lever is often located just over the driveshaft and, in addition, the tongue of the wagon (with the drive-shaft immediately above it) is often used as a step by those observing the unloading process.

7. *Operating or riding on a dump wagon, hoist wagon, forklift, rotary tiller (except walking type), or power-driven earthmoving equipment, or power-driven trenching equipment.*

The hazard associated with the dump or hoist wagon is being crushed by the descending bed. Forklifts have a double hazard of falling loads and overturning. They also accidentally may be driven over the edge of platforms. The hazards of earthmoving or trenching equipment are entanglement with moving parts and falling under a moving piece of equipment.

Farmworkers under 16 may operate walking-type rotary tillers; may clean, fuel, and lubricate equipment; and may load and unload pallets.

8. *Operating or unclogging a power-driven combine, field baler, hay conditioner, cornpicker, forage harvester, or vegetable harvester.*

These machines use rotary gears, revolving shafts, driving chains, belts, augers, conveyor belts and chains, knives, blowers, levers, and hydraulic pistons to grasp, cut, pound, grind, convey, compress, push, or pull materials. The farmworker sometimes comes in contact with moving parts, and is seriously injured when he tries to unclog, repair, or adjust the machine with the motor running.

Workers under 16 may work around these mechanisms to serve as

bagger on a grain combine, load hay bales, supply wire or twine to the baler, place crops on a belt, and the like.

9. *Operating, feeding, or unclogging any of the following machines when power driven: stationary baler, thresher, huller, feed grinder, chopper, silo filler, or crop dryer.*

Except for being fed manually, these machines are similar in construction and operation to those in No. 8, and they involve the same hazards.

Persons under 16 may still move the crop to the person feeding the machine and remove the finished product from the area.

10. *Feeding materials into or unclogging a roughage blower or auger conveyor.*

The construction, operation and hazards of these implements are generally the same as for those in No. 8. There is an additional danger that if a part of the body is caught by the turning auger, an amputation is almost unavoidable.

Farmworkers under 16 may load or unload materials from other types of conveyors, such as belt, bucket, or chain.

11. *Operating a power-driven post hole digger or power-driven post driver.*

The hazard of the post-hole digger is the danger of becoming entangled with the rotating drive. The major hazard of the post driver is the possibility of being struck by the descending ram.

Persons under 16 may set posts in holes, tamp the earth, attach and stretch wire, install gates, and repair fences.

12. *Operating, adjusting, or cleaning a power-driven saw.*

The chief hazards involved in these occupations are the dangers of amputation and severe cuts from contact with the cutting edge.

13. *Felling, bucking, skidding, loading, or unloading timber with a butt diameter of more than 6 inches.*

The hazards involved in working with timber become serious when the trees have attained substantial size and weight.

Workers under 16 are still permitted to work with timber up to 6 inches in diameter, which includes most fence posts and tier poles.

14. *Working from a ladder or scaffold at a height over 20 feet.*

Most severe injuries occur when work is done from the ladder or scaffold at a considerable height.

This section does not prohibit using ladders to reach a worksite above 20 feet as long as the work is not done from a ladder or scaffold.

15. *Working inside a gastight type fruit enclosure, gastight type grain enclosure or gastight type forage enclosure, or inside a silo when a top unloading device is in operating position.*

When oxygen is replaced by another gas or consumed by fermentation, anyone entering these storage areas is in danger of asphyxiation.

If the top unloading device is in operating position in the silo, a person may become entangled in its cutting and tearing mechanism and be injured seriously.

Employees under 16 may work inside the nongastight type silo while the unloading device is in a raised position, and they may also operate this device from outside the silo.

16. *Working in a yard, pen, or stall occupied by a dairy bull, boar, or stud horse.*

Handling these animals requires experience, skill, and strength. If they attack without warning, escape is especially difficult from confined areas.

This section does not prohibit work with these or any animals in an open area. It does not prohibit work with beef or range bulls and cattle, dairy cattle, or breeding stock on the range.

Prepared by the Labor Department's Bureau of Labor Standards, the new order will be administered by the Wage-Hour and Public Contracts Divisions.

Reprinted from "Safety Standards," Vol. XVII, No. 1, January-February 1968

Fewer Disabling Injuries On Farms WHY?

By Raymond R. Jones, Field Representative
State Compensation Insurance Fund

California agriculture showed the greatest statistical improvement of all industries in reducing disabling injuries during 1966. The reduction was 4 percent. In spite of the improvement, however, agriculture still has the third highest rate of 65.6 disabling injuries per 1,000 workers, which is twice as many injuries as the average for all California industries.

Statistics tell what happened but seldom why. Opinions were sought from several sources as to what actually caused the 4% drop in disabling injuries in agriculture. Everyone agreed there was a marked increase in use of machines on farms. The Division of Industrial Safety feels that greater effort is being made to engineer safety into the design of farm equipment, and this brought about the drop in the injury rate.

Farm Bureau's labor secretary feels that there is more to it. He points out that the caliber of workers needed on machines, such as harvesters, is higher than that of field workers. The higher caliber workers respond better to safety instructions. Also, workers on harvesters can be more easily supervised.

Further it was pointed out that numerous programs may be contributing to more awareness by farmers for the need to encourage safety among their workers. Besides programs aimed specifically at safety, others such as the Farm Foreman Training courses may well be contributing in that these teach foremen as well as farmers themselves how to better supervise their workers.

For the past two years, a number of County Farm Bureaus have worked on programs to encourage their members not only to "sharpen up" on safety but to "follow up" on injured workers. Even with minor injuries, farmers have been encouraged to immediately take the injured worker to

the farmer's own doctor for treatment, instead of letting the worker assume the responsibility of seeing a doctor. This could be preventing some minor injuries from later developing into disabling injuries.

However, the increased use of machines may increase safety hazards despite better safety designs if we don't continue to step up our efforts to educate, train and motivate farm labor to work safely.

Climbing on machines, cleaning, adjusting or oiling them without stopping the engines are continuing to cause many injuries. Meshing gears, chains and sprockets and belts and pulleys represent potential hazards if the guards are removed. Machines are still being started with men in hazardous locations. It is all in the accident reports.

Headway was made in reducing accidents in 1966, and compensation insurance rates have dropped accordingly in a number of classifications.

The challenge is to continue to improve the injury rate. With higher costs of labor, taxes and supplies, there are few ways to reduce costs. But you can reduce overhead costs by the avoidance of accidents and injuries.

From "California Farm Bureau Monthly,"
November 1967

Editor's Note: The Division concurs and is pleased to report a continued improvement during 1967, with 60.7 disabling injuries per thousand workers covered by Workmen's Compensation Insurance, down from 65.6 in 1966.

Blondes More Vulnerable

Believe it or not, medical reports indicate that blondes and redheads may be more vulnerable to poison ivy than brunettes. The lighter our skin, the more susceptible we seem to be to irritation and sensitization from the vast family of rash-producing plants and trees.

From *The Michigan Mutual Shop Man*,
September 1967

You may reprint any of our safety publications, giving a credit line to the Division of Industrial Safety, State of California. Please send us a copy of the reprint.

This Could Have Been It

The morning of February 2, 1968, started out like any other day for Walt Van Oefflin, operating a Model 657 Caterpillar motor scraper at the Altfillisch Fulton Company's grading operation above Monterey Pass Road, Monterey Park. Fastening his seat belt, he headed down slope, when about fifty feet down the slope, suddenly the equipment rolled over, coming to rest upside down.

The "657" had to be removed from the job site for repairs. Operator Van Oefflin, however, was "intact" and completed his workday on another piece of equipment—because the Cat had been equipped with a canopy, of the type approved by the Division of Industrial Safety, and the operator had fastened his seat belt.

Death or serious injury was prevented once again, due to the effectiveness of roll over protection.



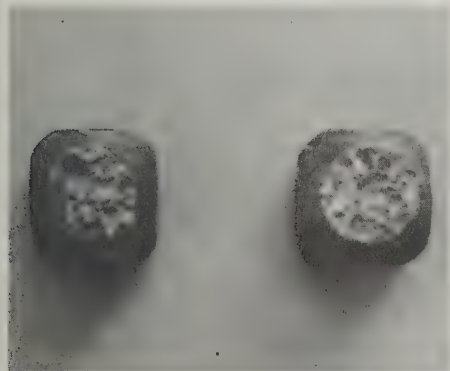
Why It Was Just A "Nightmare Six Floors Up"

William Cox dangled at the end of his safety line six floors above Market Street in San Francisco for seven agonizing minutes until firemen rescued him, while hundreds of shoppers and office workers watched. This was reported by Birney Jarvis in the *San Francisco Chronicle* on March 16, 1968. The article was entitled "A Nightmare Six Floors Up."

There is more of the story as to how William Cox escaped death. The background was furnished by Jack F. Hatton, Chief, Division of Industrial Safety, Department of Industrial Relations.

An inspection of this building, including tests, made by the Division in 1956 had disclosed that the window cleaning safety anchors then in service were unsafe, being of cast bronze material of low tensile strength. An order issued by the Division required replacing them with new stainless steel anchor bolts throughout the building. This work was completed in 1959.

So, when William Cox fell, he was suspended by a safety belt fastened to a safe anchor bolt—both items are required by California's Safety Orders. He is alive today because there is an agency interested in window cleaning safety—the Division of Industrial Safety.



These are two of the old anchors, showing the poor granular structure typical of these old devices. Had they not been replaced, Cox surely would have been killed.



Photo by Chet Born, San Francisco Fire Department. Fireman Romero assisted Cox onto the ladder.

Safety Belt Pays Off Twice

Recently an incident occurred on the Gerald Desmond Bridge, under construction in Long Beach, which again proved the value of safety belts.

A painter was working from a "float" about 100 feet above the ground. A service line attached to the float, used for hauling up material, got caught in the revolving mechanism of an oil well pump on the ground below. The line jerked the float, causing the painter to fall off. Since he was wearing a safety belt he fell about six feet.

He climbed back on the float—just as the slowly revolving pump again jerked the service line, and again he fell from the float, to the length of his safety line. Fortunately, the service line snapped at the second jerk. However, after pulling himself up to the float once more, he climbed down—to work on the ground.

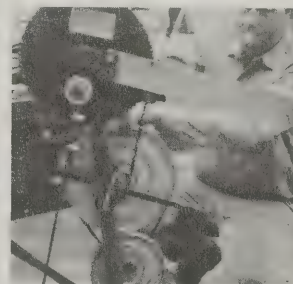
Play Ball Safer

Division Safety Engineers report that portable, mechanical pitching machines, complete with hazardous, unguarded V-belts and pulleys, meshing gears and rotating arms have appeared on the baseball fields of colleges, high schools and junior high schools throughout California.

Not only are these machines capable of inflicting injuries well-known to workmen in industry, but several budding Babe Ruths or Jimmie Foxxes have been hit on the head by a wild pitch because the machine was not anchored to a solid base.

It is recommended that these machines (both the electrical and gasoline engine types) be completely enclosed in a cage. There should be a service door which should be kept locked. Openings should be provided in the back of the cage to operate the controls and to feed balls to the machine in addition to the outlet in the front. The machine should be mounted on a concrete base. The area in front of the machine to the backstop should be guarded or flagged.

For assistance, phone the nearest office of the Division of Industrial Safety (See back cover).



Machine As Sold



Cage Guard

FARM SAFETY CHECK LIST

More Lost Fingers



The commercial meat grinder pictured above had to be sawed in two in order to free the operator's hand.

During 1967, 45 Californians got caught in meat grinders; 8 of them lost one or more fingers. Two were minors (under 18 years of age). These statistics refer only to injuries to employees, reported in compliance with the California Labor Code.

This type of accident is one which can be prevented by compliance with safe practices and the cooperation of equipment manufacturers.

The food industry has gone a long way in this direction but this particular accident (along with many others) is proof more attention to mechanical guarding is still needed.

In this particular case, meat was not being ground; the machine was being cleaned. Obviously, the power was not disconnected. But of greatest importance is the fact that the guard was not an integral part of the hopper and had been removed permitting the operator to reach inside.

FARM BUILDINGS

Yes	No	DO YOU
-----	-----	1. Keep your buildings in good repair?
-----	-----	2. Keep stairs repaired, free from rubbish and equipped with hand rails?
-----	-----	3. Keep ladders repaired, serviceable, and properly anchored when using?
-----	-----	4. Provide railings for all loft openings?
-----	-----	5. Guard against spontaneous combustion?
-----	-----	6. Light haymows adequately, and have electric switches conveniently located?
-----	-----	7. Keep from storing loose materials overhead?
-----	-----	8. Prohibit smoking in and around the barn?

ANIMALS

Yes	No	DO YOU
-----	-----	1. Securely pen bulls, boars, and stallions?
-----	-----	2. Use a bull staff when handling bull?
-----	-----	3. Use care in handling animals with new born?
-----	-----	4. Use a breeding chute?
-----	-----	5. Keep vicious dogs securely tied or penned; away from children?
-----	-----	6. Instruct children in the proper care of pets and farm animals?
-----	-----	7. Speak to animals before entering stalls?
-----	-----	8. Securely tie horses before leaving them?

MACHINERY

Yes	No	DO YOU
-----	-----	1. Keep your machinery in good repair?
-----	-----	2. Properly store your machinery and tools when through using?
-----	-----	3. Properly protect exposed belts, gears, power saws, by adequate guards?
-----	-----	4. Stop all machinery before making adjustments, repairs or refueling?
-----	-----	5. Keep small children away from dangerous machinery?
-----	-----	6. Instruct new or inexperienced help in proper operations of machinery?
-----	-----	7. Avoid operating tractor on dangerous inclines?

GENERAL

Yes	No	DO YOU
-----	-----	1. Keep the farmstead clean, neat and free from rubbish?
-----	-----	2. Remove nails from loose or broken boards?
-----	-----	3. Keep loose barbed or baling wire picked up?
-----	-----	4. Keep your fences repaired?
-----	-----	5. Keep unused lumber carefully stacked?
-----	-----	6. Keep the handles tight in axes, hammers, sledges and picks?
-----	-----	7. Discard broken or unused machinery?
-----	-----	8. Have an adequate means of fighting farm fires?
-----	-----	9. Keep poisonous materials securely locked up?

From Safety Brochure by Accident Prevention Division, Salem, Oregon

FARM HOME SAFETY CHECK LIST

MAKE YOURS A SAFER AND HAPPIER HOME . . . CORRECT ALL UNSAFE CONDITIONS

KITCHEN

Yes	No	
-----	-----	Are sharp knives kept in a rack separately from other knives?
-----	-----	Are cooking utensil handles turned away from stove edges to prevent tipping?
-----	-----	Do you disconnect the electric iron and washing machine cords when not in use?
-----	-----	Do you use a safe stepladder instead of a chair?
-----	-----	Do you keep lye, disinfectants, and cleaning fluids out of reach of children?
-----	-----	Do you have regular potholders for handling hot pans?
-----	-----	Are you certain window curtains cannot blow over stove flames?

STAIRWAYS AND HALLS

Yes	No	
-----	-----	Are stairways and halls kept free from boxes, toys, mops, brooms, tools, and any other tripping hazard?
-----	-----	Are small rugs kept away from the head and foot of the stairs?
-----	-----	Are all stairways and halls adequately lighted?
-----	-----	Are stairways barred by gates to prevent small children from falling?
-----	-----	Is stair carpeting securely fastened?
-----	-----	Are there handrails for all stairways?
-----	-----	Are top and bottom cellar and attic steps painted white for better visibility?
-----	-----	Are all platforms, stair-treads and porch steps in good repair?

LIVING AND DINING ROOM

Yes	No	
-----	-----	Are rugs fastened down or laid on non-slip pads?
-----	-----	Is furniture placed to allow free passage and checked at night for orderliness?
-----	-----	Do you keep rugs from curling at the edges?
-----	-----	Does the fireplace screen fit snugly?
-----	-----	Are furniture and woodwork in good repair?
-----	-----	Are electric cords placed properly to prevent possible tripping?

BEDROOM

Yes	No	
-----	-----	Do you keep bureau and dressing table drawers closed when not in use?
-----	-----	Do you turn off gas and electric heating devices before going to sleep?
-----	-----	Do you prohibit smoking in bed?
-----	-----	Is there a night lamp in bedroom and hall?
-----	-----	Is there a light switch in easy reach from the bed?
-----	-----	Is furniture placed to allow clear passage between door and bed?

BATHROOM

Yes	No	
-----	-----	Do bathtubs and showers have hand-holds and non-skid mats?
-----	-----	Are all electrical connections out of reach from the bathtub?
-----	-----	Are electrical pull chains provided with insulated links?
-----	-----	Do you turn on the light before taking medicine?

FOR EMERGENCY

Yes	No	
-----	-----	Do you know the location of water, gas and electric shut-offs?
-----	-----	Do you know elementary first aid procedure and do you have a well supplied first aid kit?
-----	-----	Do you know which is the nearest exit in case of fire?
-----	-----	Do you know the location and how to call the fire department?

GENERAL

Yes	No	
-----	-----	Are guns unloaded and stored in locked cases?
-----	-----	Do you have a strong rigid stepladder, in good repair, and stored out of the way?
-----	-----	Do you have a place for everything and keep everything in its place?
-----	-----	Do you have a sufficient number of ash trays?
-----	-----	Do you have metal containers for storage of oil mops, dust rags and painting equipment?
-----	-----	Do you have chimneys and stovepipes inspected and cleaned regularly?

From Safety Brochure by Accident Prevention Division, Salem, Oregon

Stress Positive Aspects Of Safety Campaigns

The use of fear tactics in accident prevention will not work. People don't respond to fear. A safety program that is based on case histories, illustrations or anecdotes about injuries and accidents is doomed to failure. Thus, exhorting employees to wear safety glasses because of flying chips, to mop up spillage because they may slip and fall, or to buckle seat belts to avoid driving injuries, is all in vain. Any meaningful response would be temporary, at best.

The reason these tactics won't work is because most human beings, when confronted with fear and danger, employ a mental defense known as the "denial mechanism." They deny they will be injured—that though the danger may exist, it's the other guy who's likely to be hurt, "not me." This is a normal reaction, and a healthy one. In certain circumstances it can be valuable. It permits a person

to develop the courage he needs to enter an inherently dangerous situation. But for industrial safety directors, it represents a challenge and must be overcome if accidents are to be prevented.

Most safety directors are perceived as parental figures. The very nature of a safety director's job requires him to urge employees to utilize their protective equipment and obey the safety regulations—just as parents tell their children to don their protective clothing and mind their manners: "Don't forget to put on your (hard) hat." "Always wear your (safety) boots." Safety directors tend to treat their personnel as if they were passive and dependent, as parents treat their children. Employees resent this. Such resentment often leads to anger, carelessness or reprisals—meaning more, not fewer accidents.

Once these challenges are recognized, doing something about them becomes a relatively simple matter. Try to associate your safety program with *masculinity, maturity and strength*. Insist that company figureheads, such as top executives, shop foremen and union representatives, play a leading role in the prevention of accidents. Such people should take the initiative in wearing safety clothing, heeding the regulations, calling attention to and correcting hazardous conditions. Use prestige figures—the hardest working and most productive people in the plant—to emphasize that safety is an essential ingredient of job and career success. Slogans, posters and buttons should play down the fear theme and concentrate on the positive aspects of accident prevention. Only by using such techniques are you likely to evoke a favorable response and permanently minimize on-the-job injuries.

By M. R. Feinberg, Ph.D., from BFS Management Reports, May-June, 1967, published by BFS Psychological Associates.

Injury Season's Here For Farmers Who Use Sprays

By John Myers, Safety Engineer
Division of Industrial Safety

The season has arrived when it becomes necessary to spray and dust many acres of orchards and fields to prevent insect damage to the fruit and crops. Thousands of pounds of dust and thousands of gallons of liquid—all extremely hazardous materials—will be dusted, poured, mixed and sprayed by farm workers.

Many of them and some employers are not fully aware that only a small amount of some of these dangerous materials is sufficient to kill a person if accidentally absorbed by the body.

For example, a few drops of concentrated insecticide on the clothing or skin have resulted in several fatalities in California. A few drops of concentrated parathion splashed in the eye could be fatal; so could a few grains of phosdrin dust on the skin. Therefore, handlers and users of these hazardous materials must take every precaution to insure that none touches or enters the body.

The Division of Industrial Safety has concluded during the course of its investigations that the following unsafe practices are the most frequent causes of severe injuries to the worker:

Not instructing the worker as to the hazards of the material. This is especially important in the case of those who do not speak or read English.

Failure to read and follow safety precautions printed on the container label.

Failure to wear protective clothing; or wearing torn or damaged clothing; or clothing which absorbs and retains hazardous materials; or spilling hazardous material on the body through careless handling and not stopping immediately to wash and change into clean work clothing; or continuing to wear clothing which has absorbed some of the hazardous material; or not properly cleaning protective clothing or equipment after use.

Not taking a shower and changing to clean clothing after work.

Failure to wear a respirator; or wearing one of a type not approved.

Not seeking medical attention immediately at the onset of illness.

When medical attention is needed, the ingredients of the injurious material that was used must be known. The label should be copied down; or if practical, the container itself may be taken along and shown to the physician.

The Division emphasizes that chemicals used in farm operations can be safely stored, handled and used if their hazardous nature is fully understood and necessary precautions, including the use of personal protective equipment, are observed.

New Safety Brochures

Two new, or revised, safety brochures are being printed and should be available for distribution before this issue of the CSN reaches you.

They are:

S-124, "Safety Rules For Roofers."

It analyzes recent injuries to roofers over a 12-month period and describes how to avoid them.

S-145, "Publications Available."

A listing of current safety brochures, placards, stickers and reprints of articles from the CSN which are available from the Division of Industrial Safety including a brief description of each.

National Accident Costs

The National Safety Council estimates that during 1967 industrial accidents cost a total of \$6 billion. Fire losses in industrial and business property damage added another \$800 million bringing the total for work accidents to about \$6,800,000,000.

WORK INJURY PUBLICATIONS AVAILABLE ON REQUEST

Some recent publications of the DIVISION OF LABOR STATISTICS AND RESEARCH are listed below. The reports are available without charge from that Division, P.O. Box 965, San Francisco, 94101

	<i>Published</i>
Weekly Wages of Injured Workers, California, September 1967.....	May 1968
Work Injuries in California Agriculture, 1966.....	April 1968
Work Fatalities in the Forest Products Industries, California 1967.....	March 1968
Work Injuries in California, Statistical Summary January-June 1967	January 1968
Electrical Work Injuries in California, 1966 (Issued jointly with Division of Industrial Safety).....	September 1967
California Work Injuries, 1966.....	August 1967
Work Injuries in California.....	Monthly

Recent issues of the report have featured articles on:

- Disabling Work Injuries in Fish Canning and Preserving
- Farm Transportation Accidents
- Disabling Work Injuries in Nursing Homes and Convalescent Hospitals
- Disabling Work Injuries in Service Stations
- Work Injuries to Janitorial and Maintenance Workers Employed by Building Service Firms
- Work Fatalities in California, 1966
- Disabling Work Injuries Involving Backing Trucks

Liquid Nitrogen Refrigeration Hazards

The use of liquid nitrogen as a coolant in trucks and trailers is not new. However, from time to time some hazards have presented a problem. One source of potential injury is the fact that pressure may build up in the van, so that when the doors are unfastened they may swing open suddenly and forcefully, striking the person opening them.

A review of several such accidents indicated that they were occurring on the newer truck and trailer bodies, which are well insulated and virtually airtight. All of the bodies had drain holes and piping to allow the moisture condensed from the atmosphere to escape from the truck. However, because of debris or other mechanical blocking, the condensed moisture would freeze as the temperature was reduced and plug the drain pipe. Then, as more nitrogen was added, a low pressure built up in the truck body.

To prevent such accidents, it is recommended:

1. A pressure vent flap be installed at a high level, held in position by a magnetic type seal similar to that currently utilized by domestic refrigerators. This releases at about 0.1 psi.
2. The pressure inside the truck be vented before the door is unfastened.
3. The doors be fastened fully open, and at least four minutes, preferably five be allowed to elapse before the van is entered.
4. A fan be installed at the front of the van and interlocked to turn on when the doors are opened. A fan is necessary whenever a refrigerated van is used in cold climates; natural diffusion cannot be depended upon to ventilate the enclosure.

The following should assure safety of employees working in or around refrigerated vans:

1. Every mobile refrigerated compartment shall have at least one door which can be opened from inside the compartment and such door shall be so located as to provide a safe means of egress.
2. In addition to the above there shall also be provided and maintained in workable condition a suitable axe, pinch bar or other tool which will enable a person to escape if the door should freeze tight.
3. Floors should be covered with non-slip material because one of the biggest hazards associated with refrigerated vehicles is slipping on floors covered with ice.
4. The liquid nitrogen system is to be interlocked with the doors in such a way that the nitrogen supply is shut off while the doors are open. This will prevent skin burns from liquid nitrogen and possible asphyxiation.
5. To assure that the oxygen concentration is adequate, a simple match test could be made before entering the van. If the match does not burn normally—do not enter.

Offices of the Division of Industrial Safety

The following is a list of main and field offices of the DIS.

MAIN OFFICES

SAN FRANCISCO.....455 Golden Gate Ave. 94102 415-557-1946
Los Angeles.....3460 Wilshire Blvd. 90005 213-381-5695

OTHER OFFICES

Bakersfield.....225 Chester Ave. 93301 805-324-6437
Chico.....341 Broadway 95926 916-343-5182
Eureka.....619 2nd St. 95501 707-442-5748
Fresno.....2550 Mariposa St. 93721 209-268-7151
Long Beach.....230 E. 4th St. 90812 213-432-8443
Modesto.....1024 J St. 95354 209-529-7751
Oakland.....1111 Jackson St. 94607 415-834-3460
Redding.....2115 Akard Ave. 96001 916-246-1621
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Salinas.....307 Soledad 93901 408-424-7327
San Bernardino.....303 W. 3rd St. 92401 714-888-9321
San Diego.....1350 Front St. 92101 714-232-4361
San Jose.....888 N. 1st St. 95112 408-294-1525
Santa Ana.....1624 W. 19th St. 92706 714-547-1603
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Ventura.....3418 Loma Vista Rd. 93003 805-642-9679

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Governor's Industrial Safety Conference Issue



STATE OF CALIFORNIA
EXECUTIVE DEPARTMENT
OFFICE OF THE GOVERNOR
SACRAMENTO

Proclamation

INDUSTRIAL SAFETY WEEK
FEBRUARY 4-10, 1968

Whereas, THE STRENGTH OF OUR ECONOMY LIES IN THOSE MEN AND WOMEN
WHOSE LABORS RESULT IN THE PRODUCTS OF AGRICULTURE, BUSINESS, AND INDUSTRY;
AND

Whereas, THE PRESERVATION OF THE HEALTH, SAFETY, AND WELL BEING OF
THIS LABOR FORCE IS NECESSARY TO THE CONTINUED GROWTH OF THIS, THE LARGEST
STATE IN THE NATION, ITS PRODUCTIVITY AND PROSPERITY; AND

Whereas, THE DEPARTMENT OF INDUSTRIAL RELATIONS AND ITS DIVISION OF
INDUSTRIAL SAFETY WILL CONDUCT THE GOVERNOR'S INDUSTRIAL SAFETY CONFERENCE ON
FEBRUARY 7-8, 1968, WHEREIN REPRESENTATIVES OF MANAGEMENT, LABOR, AND THE PUBLIC
WILL MEET TO FURTHER ADVANCE CALIFORNIA'S OUTSTANDING PERFORMANCE IN INDUSTRIAL
SAFETY ACHIEVEMENTS;

Now, Therefore, I, RONALD REAGAN, GOVERNOR OF THE STATE OF
CALIFORNIA, DO HEREBY DESIGNATE THE WEEK OF FEBRUARY 4-10, 1968, AS

Industrial Safety Week

AND URGE ALL CALIFORNIA'S CITIZENS TO RECOGNIZE AND FOLLOW GOOD SAFETY
PRACTICES ALL THIS WEEK AND ALL THE REMAINING WEEKS OF THIS YEAR.



IN WITNESS WHEREOF,
I HAVE HEREUNTO SUBSCRIBED MY
NAME AND CAUSED THE GREAT SEAL
OF THE STATE OF CALIFORNIA TO
BE AFFIXED AT SACRAMENTO, THIS
TWENTY-NINTH DAY OF
DECEMBER, IN THE
YEAR OF OUR LORD, ONE THOUSAND
NINE HUNDRED AND SIXTY-SEVEN

Ronald Reagan
Jack F. Hatton

Cover Picture

The photo on the cover shows Governor Ronald Reagan signing the above proclamation. In attendance at the ceremony were, left to right: Jack F. Hatton, Chief of the Division of Industrial Safety; Albert C. Beeson, Director of the Department of Industrial Relations; Governor Reagan; Frank Murphy, Jr., Assemblyman from Merced.

Assemblyman Murphy introduced the proclamation as Assembly Concurrent Resolution No. 2. It was coauthored by Senators Donald L. Grunsky (R) of Watsonville and Howard Way (R) of Exeter.

CALIFORNIA SAFETY NEWS

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Ronald Reagan, Governor of California
Albert C. Beeson, Director of Department
Jack F. Hatton, Chief of Division

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The California Safety News is mailed free
of charge to those interested in industrial
safety.

Conference pictures in this issue
are by Safety Engineers
P. T. Donohoe
G. W. Jewett, Jr.
Division of Industrial Safety

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GOVERNOR REAGAN ADDRESSES SAFETY CONFERENCE

Some Highlights of the Address

Like you, I have a personal interest and concern in the reduction of accidental injuries in California. I well remember the suffering I went through after breaking a leg in six places. The size of the attendance at this meeting indicates that interest in this important work of saving lives and preventing industrial injuries is growing.

We are a large and growing State. Civilian employment surpassed the seven and one-half million mark for the first time last September. These millions work in about 400,000 places of employment. Many are exposed to on-the-job work hazards in varying degrees—and unfortunately these hazards take their toll each day, in the form of unexpected and unwanted accidents. Last year in California, there were approximately 195,000 industrial injuries and 669 deaths. The direct cost of injuries in the form of workmen's compensation paid was approximately \$500,000,000. That is almost one-half the State's total revenue from the increased income tax. This figure does not include the indirect accident costs. Depending on the type of industrial environment involved, the indirect costs due to such things as loss of production, failure to meet contract schedules, damage to facilities and equipment, and many other intangibles, including morale of employees, will make the total loss from three to four times higher. In California we are used to big numbers and are trying to make most of them smaller. This is one we can and should make smaller.

Injury Rate at All-Time Low

Between 1950 and 1958 California had a healthy twenty-five percent reduction in disabling industrial injuries. Since 1958, however, there has been only slight improvement in the percent of accidents. Obviously there is genuine need for a renewed effort to get the accident graph started downward again. This is true especially in the manufacturing industry which has shown a significant increase in its disabling injury rate during the last few years.



On the bright side, a recent estimate released by the Division of Labor Statistics and Research in the Department of Industrial Relations indicates the over-all industrial injury rate for 1967 will be at an all-time low of 30.7 disabling injuries per 1,000 workers, down almost three and one-half percent from 1966. Fatalities in 1967 were down seven and one-half percent. We can take considerable satisfaction from these figures, and we can all hope that this downward trend will continue.

Traffic Safety

Traffic safety is a vital part of our accident prevention effort. About one-third of our industrial deaths each year are attributable to vehicles. There were 4,286 traffic fatalities during the first eleven months of 1967. Another 211,000 were injured. Both figures are far too high and this Administration is taking action to reduce them.

The drinking driver is one of our most serious problems. Alcohol is involved in approximately thirty-five percent of all fatal auto accidents. We are seeking a way to stop issuing drivers' licenses to chronic alcoholics, and I am hopeful that a three-year trial program now underway will prove effective. Additional legislation will be proposed this year to establish a presumptive limits law to provide new protection from the drinking driver.

We will support legislation which will require special licensing procedures and special protective equipment for motorcyclists.

Off-the-Job Accidents

There are other sources of off-job injury and death that need attention. The fact that home accidents cause twice as many deaths as work accidents is important to everyone here. Many of those injured at home are members of our industrial work force and thus a loss to our productive capacity as well as to their families when unable to work. Falls and burns are the most frequent causes of home deaths. These can only be reduced through stepped-up public education programs.

It is obvious that there is much work to be done in all fields of accident prevention. Such work demands leadership from you here today and others like you.

Your interest in preventing traffic and home accidents along with those in industry is in keeping with a trend toward a broad, public spirited move for accident prevention in all human activities.

As an example, labor unions in recent years have teamed up with the National Safety Council and other organizations in a campaign to make Labor Day a safe day.

The matter of off-the-job injuries, whether on the highways, at home, or elsewhere, is especially important to those who work for wages, and to those labor officials and employers who concern themselves with the welfare of such workers. Even with the help provided by workmen's compensation, industrial injuries are a serious blow to the security and well-being of the working man and his family. Off-the-job injuries cause even greater financial problems since there is no assurance that such injuries will be covered by payments corresponding to those provided by workmen's compensation.

I would urge that you continue to expand your safety efforts in all areas so that your knowledge and experience in the industrial safety field will be helpful in preventing injuries every-

Continued on page 4

Governor's Address Continued

where. Fortunately, many of the methods of accident prevention effective in industrial operations are equally effective at home and on the highway.

Employers these days are also paying more attention to off-the-job safety, not at the expense of industrial accident prevention, but as an extra effort to avoid job disruption from injuries wherever they might occur. Industry is aware that its strength and its ability to earn a profit rests with the strengths and abilities of its individual workers—workers who are on the job and free from injury.

Society has an obligation to do what it can to reduce accidents in every area. Industry especially must take a lead role since it has a moral responsibility to send its workers home at night in good physical condition—tired, perhaps, but at least healthy. In order to do this, industry must make employment and places of employment as safe as humanly possible.

New Hazards

New techniques in manufacturing processes, some of which require the use of inherently hazardous materials, now form a part of the industrial complex. Industry is dealing with higher temperatures and pressures. The use of radioactive materials is increasing. New chemicals and solvents are being developed. Techniques are becoming more sophisticated, requiring in some cases specialized knowledge to prevent accidents including fires, explosions, and collapse. The safety problems encountered today are far different from those found in industry just a few years ago, and I do not pretend to know the answers. I have faith, however, in your ability to solve these problems for the future welfare of our workers.

Government, of course, also has a responsibility, especially in California where laws require that minimum standards of safety be maintained. It is the government's job to see that these standards are appropriate, reasonable, and up-to-date. Procedures must be maintained for their enforcement in accordance with the law—a responsi-



Audience Filled Grand Ballroom

bility of our Division of Industrial Safety. Fortunately there are many employers who willingly follow safety standards well above the minimums required by law—a situation that allows our Division of Industrial Safety to devote a larger portion of its time to the educational and training aspects of safety.

Education

The theme of this Conference is safety education. Widespread education is indeed an essential ingredient in stimulating proper safety attitudes and interest. Over half of our industrial injuries are preventable by the avoidance of unsafe acts. Of course this is *not* the whole story, and it is *not* the easy answer to all our safety problems. But it is worth the big push that this Conference group is capable of launching. It may be the means by which the industrial injury rate is again started on a trend of definite decline.

Safety to be effective must be constant, and if it is to be fully effective, we must work at it every day. William Wrigley was once asked why he devoted so much of his advertising budget to billboards. He replied that "If you tell people often enough about something, some of it is bound to sink in."

The individual cannot be overlooked; his work procedures must be examined to eliminate faulty habits and unwise short cuts that will eventually lead to an accident. Supervisors have a responsibility to teach and train workers in the safe way to perform industrial tasks and to augment their safety programs with periodic safety meetings or discussions.

Our labor organizations also have an important part to play in this endeavor—by promoting and by endorsing safe work practices in cooperation with business and industry.

I've enjoyed being here today. I know your discussions and deliberations will prove to be effective in this important battle that must be continually waged against needless accidents.

We in government are working on many parallel problems. Spencer Williams (Administrator of Health and Welfare Agency) is working on a plan to break the cycle of dependency—to make people on welfare independent. We need to educate and provide new skills to the hard core unemployed. In all of these matters, government will cooperate with you. We'll heed your advice. We'll work together. Our attitude is expressed by "What can we do to help?"

THE PROGRESS OF THE PEACEFUL ATOM

Excerpts from a talk by

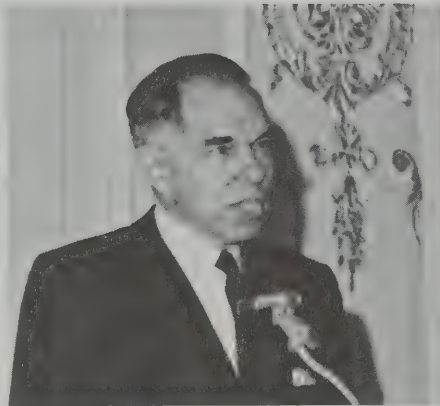
DR. GLENN T. SEABORG
Chairman, U. S. Atomic Energy Commission

The large and diverse field of the peaceful applications of nuclear energy is growing so rapidly today that I have been referring to it in my talks as a new and very promising form of "nuclear proliferation." This encouraging proliferation of the peaceful atom affects almost every area of human endeavor.

Perhaps the most significant attribute of the peaceful atom is its ability to generate electricity. Within just the last two years the growth of nuclear-electric power has risen remarkably. In 1966 and 1967 more than one-half of the announced new steam generating capacity in the United States was nuclear-powered. We now have in operation, under construction and planned, a total of more than 85 nuclear power plants with a combined capacity of more than 60,000,000 kilowatts. While our present nuclear generating capacity is 2,800,000 kilowatts, our projections indicate that by 1980 this total will rise to 150,000,000 kilowatts and by the year 2000 to more than 700,000,000 kilowatts.

Nuclear energy opens up vast new resources at a time when the world's demand for energy is rapidly expanding. Nuclear power's timeliness is also important in relation to our current concern over environmental pollution, as nuclear power plants do not add to the burden of air pollution. This suggests, incidentally, that an additional reduction in air pollution could result from using electric automobiles that operate on batteries recharged by nuclear-generated electricity—a significant consideration here in California.

Since this is a safety conference, let me inject a few words on the safety of nuclear power plants. This is a subject that naturally comes up in a discussion of a source of energy that had its birth in wartime and has left an almost indelible mark on the public's mind as a destructive force. Today, unfortunately, some groups opposed to nuclear power exploit this image of the atom to try to make the public believe



Dr. Seaborg Addressing General Assembly

that nuclear power plants are unsafe. But the truth of the matter is that nuclear power plants have a remarkable record of safety. They are designed to be safe. They are constructed to be safe. They are licensed and regulated to be safe. And they are operated to be safe.

Those who question nuclear power on the grounds of safety have what they feel are impressive statistics on nuclear accidents over the past twenty years. But if you stop to analyze these statistics you will see that they, in fact, prove the excellent safety record of nuclear power. Statistically speaking, it can be shown that you are far safer living next to a nuclear power plant than you are driving to and from work every day in your own car.

Let me point out that, while there have been some fatalities from accidents involving *experimental* nuclear work, in the more than two decades that nuclear power plants have operated in this country, not a single member of the public has been killed or injured by an accident at a central station nuclear power plant. We are making every effort to see that this record continues with a vigorous program of both regulation and research and development.

In addition to nuclear power plants being safe, the nuclear industry has been outstanding in the safety of all its operations. In fact, we have even improved on our fine safety record this past year. The year 1967 proved to be the safest in AEC's 21-year his-

tory with an injury frequency rate (number of disabling injuries per 1,000,000 man-hours worked) of about 1.42 for AEC and its contractors. This surpasses the all-time previous record of 1.54 established in 1966 and can be compared to an overall industry average for 1966 of 6.91. The Atomic Energy Commission and the entire nuclear industry are very proud of this safety record and we are going to strive to maintain it as nuclear energy continues to grow.

Bearing all this in mind, let us look ahead at developments in the nuclear field. It has been forecast that the future use of large nuclear power plants could result in savings of billions of dollars to the consumer—and those would be net savings far beyond any research and development cost that the taxpayer has invested in this technology.

One nuclear development that is already attracting attention in the U.S. and around the world is the forthcoming use of nuclear power to desalt seawater and brackish water.

Last November I had the pleasure of participating in the signing of contracts that authorize the construction of the first dual-purpose nuclear plant, a plant that will generate 1,800,000 kilowatts of electricity and desalt 150 million gallons of water per day. This nuclear-powered unit, located here in California on a man-made island just south of Los Angeles, will produce more fresh water than the combined output of all other desalting units throughout the world. This, of course, will be another important "first" for the State of California.

The possibility of using large multipurpose nuclear-powered plants to generate electricity, desalt seawater and also produce fertilizer has led to the concept of the nuclear agro-industrial center.

Such centers, located at tropical coastal areas and operating in conjunction with highly scientific farms . . . could produce . . . enough to feed many millions of people—on what had previously been useless land.

Continued on page 6

Peaceful Atom—Continued

Through nuclear power we hope to use seawater in another way—by using the heavy hydrogen in the ocean to generate power through controlled fusion. Solving the problems of controlled fusion will certainly be worth almost any effort we put forth; for fusion of the atoms of heavy hydrogen available in the oceans of the world will open up an energy resource equivalent to 500 Pacific Oceans filled with high-grade petroleum.

There will come a time—in the not-too-distant future—when we will depend more on the sea for natural resources—for food, minerals and other materials.

If we move from the sea into space we can readily foresee other important roles for nuclear energy and nuclear science. Before the end of this century we will probably see nuclear reactors, perhaps no larger than a small automobile but producing more power than the world's largest hydroelectric dam, supplying the power for nuclear rockets carrying manned missions to Mars.

One can speculate almost endlessly on the role that nuclear energy and nuclear science can play on the moon and in space. But one nuclear-space venture that I would hope would go a long way in uniting men here on earth would be putting into operation nuclear-powered synchronous satellites for worldwide television. Because of their positions in orbit and the power from their small reactors, these satellites could send signals directly into homes all over the globe. If such a system could be wisely used on an international basis it might prove to be one of our best educational tools and means of promoting international understanding and peace. It could bring not only new knowledge but a new level of cultural enrichment to people living in today's remote areas of the world. Every village, every family, regardless of its location, could share something of the excitement and richness of an event on the other side of the world.

... I would like to discuss the quietest, most unobtrusive of the peaceful atoms—but the most versatile and, in many ways, the most valuable.



General Assembly Overflows Gold Room

I refer to radioisotopes—used in biology and medicine, agriculture, industry, and many types of research in numerous and varied ways . . .

Over the past 30 years more than 100 different radioisotopes have been used in medical research. Today some 30 different radioisotopes are used around the world in the diagnosis and treatment of many diseases and disorders.

Radioisotope tracers have helped agricultural researchers to develop healthier plants and farm animals by revealing the best and most productive kinds of fertilizer and feed. Radiation from radioisotopes and reactors has produced plant mutations that have been selectively bred to create hardy strains of crops resistant to certain diseases and the effects of bad weather.

Radioisotopes, used in a variety of process control devices, are also making a substantial contribution to the world's industry—one amounting to the saving of hundreds of millions of dollars annually.

Radioisotope gauges of extreme sensitivity are used routinely today to measure thickness, flow rate, dilution and distribution. They will control the thickness of sheet steel and cigarette paper and the amount of glue on a postage stamp, the amount of sugar in applesauce and the fat content of baby food and help to bring you safer auto

tires, better roofing materials and even a fuller can of beer. Other types of radioisotope gauges will indicate to construction engineers the soil density and surface moisture of an area for a prospective railbed, roadbed or airport runway. And similar gauges are used to indicate the density of snow in the mountain areas so that a forecast of the water in the spring run-off from the watersheds can be made.

Another research and investigative technique that is proving highly useful and intriguing in its possibilities is neutron activation analysis. This technique, which can detect the most minute amounts of an element in a material or object, has become a very important means of non-destructive testing, a tool for scientific research and even a method for criminal investigation.

I hope that I have given you some ideas of the vast range of peaceful nuclear developments. I believe these developments are worth pursuing and that the public should know that a great many people are devoting much time, talent and effort to the proliferation of the peaceful atom. Hopefully, they will someday prove that man has the will and good sense to use the energy of the atom, as well as all the new power of his modern science and technology, only for peace and progress.

HARRY BRIDGES ADDRESSES CONFERENCE



In addressing this body on the subject of "Safety on the Job," I want to say at the outset that not only does the union I represent—the ILWU—insist that safe working conditions is an important function of a labor organization in general, but for many years the ILWU considered it a first and foremost responsibility of the union.

The ILWU is made up of many divisions. That includes longshore or waterfront work, warehouse operations, and many thousands of jobs in the two basic industries of the State of Hawaii, namely, sugar and pineapple production, and many thousands of miscellaneous workers.

In all its divisions, and in the interest of each and every one of its individual members, the ILWU gives safety on the job a role equal in importance to that of job security, wages, hours and working conditions.

However, it is in the longshore division of the ILWU where safety on the job—or more properly, accident prevention—is of prime importance; maybe even to the extent of coming before hours, wages and conditions.

The longshore industry is full of hazards. Ship loading and dispatching operations, as well as operations on the dock, are just downright dangerous at all times. The fact is that such operations just cannot be made safe, that is, *absolutely* safe.

This means there will be accidents. Far more accidents than in practically any other industry. Such accidents will occur, and do occur, despite all the precautions taken both by employers and workers, despite what rules may be adopted, and despite everyone involved

doing their utmost to prevent accidents.

Just a few of the factors which bring about such a situation and that make longshore work more hazardous than most other is that the place of work for longshoremen or dock workers is never the same: different ships arrive and depart with different cargoes; different ships must be worked with different types of hoisting equipment and other forms of gear; and different cargoes must be handled, each presenting different safety hazards. Types of cargoes on docks and piers and ships are constantly changing and methods of handling such cargoes are constantly changing, and the overall result poses innumerable safety problems.

Such are the facts of the situation with respect to waterfront operations. Slice it anyway you like, there will be accidents. Exercise all the care and prevention possible, there will still be accidents. Some because of negligence on the part of workers or management, some due to faulty gear or equipment; but most due to the fact that the work is just downright dangerous and hazardous and the hazards cannot be completely removed.

If there is one area of agreement that we share with our waterfront employers, the Pacific Maritime Association, it is in this area of seeking complete safety on the job and the prevention of all accidents.

As a matter of fact, more than 30 years ago this month, in an industry-wide agreement signed by our union and the Pacific Coast Shipowners' Association, following a strike of some three months' duration, one section of the joint agreement specifically called for the negotiation and adoption of a safety code for all longshore operations; such a code to be made a part of the industrywide agreement.

The principle set forth in that understanding, signed February 4, 1937, to guide and direct the parties in negotiations for a safety code and accident prevention prevails in the following slogans:

If it is a question of convenience vs. safety, Safety First.

If comfort vs. safety, then again, Safety First.

If tonnage vs. safety, then again, Safety First.

A safety code was ultimately negotiated and made part of the coastwise longshore agreement and it is presently incorporated in the industrywide agreement between the ILWU and the PMA as a Pacific Coast Marine Safety Code. This code amongst other things calls for the establishment at local levels of joint job level safety committees which are to meet at regular intervals. The main purpose of such committees is not only enforcement of the safety code, but, above all, the prevention of accidents on the job.

The requirement that union and employer both abide by the rules set forth in the Pacific Coast Marine Safety Code, is simply recognition of the fact that prevention of accidents is mutually beneficial—profit-wise and financially—to employer and worker.

All agreements between our union, the ILWU, and steamship companies and waterfront employers of the Pacific Coast, British Columbia, Alaska and Hawaii, carry the specific provision which allows longshoremen and dock workers to refuse to work under conditions which they in good faith believe to endanger their health and safety.

Such a rule, we have found based on years of experience, is one of the best ways to preserve safety on the job and to prevent accidents. For me to say, however, that the rule is never misused or abused, would be to misstate the facts. But, the rule when applied in good faith is as powerful a safety device in labor relations as our union has been able to think of so far.

It occurs to me—in discussing this—that it was not too many years ago when the question of safe working conditions was not only usually barred from consideration in collective bargaining matters, but practically no state or federal laws existed to protect workers from unsafe working conditions or provide medical treatment and compensation if and when accidents did occur.

Even in my own lifetime—as a young man sailing as a merchant sea-

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man—I recall many shipmates being injured and being lucky to receive even a measure of medical attention let alone any compensation for loss of limb, or an eye, or other severe bodily injury.

It was not until 1911—in this century—that some dozen states of the United States passed laws providing for workmen's compensation and it has been primarily because of the drive and thrust of the organized labor movement (both prior to that time and since) that federal as well as state workmen's compensation laws have been strengthened and liberalized in every way.

As I have said, the ILWU has at all times placed great emphasis on the importance of safety on the job. As a union we have continually frowned on the type of thinking which allows hazardous or unsafe operations to be carried on as long as premium rates of pay prevail. We have no patience with this type of approach.

Under the general policy of our union and under the provisions of our agreements, every new worker coming into the industry must complete a safety training course conducted by union and employer. We receive the assistance of the U.S. Bureau of Labor Standards on this program, and, here in the State of California, the California Department of Industrial Relations. Great interest is shown by our new workers in safety training and plans are under way in keeping with the terms of our collective bargaining agreements for annual refresher courses for all members of the work force.

Notwithstanding whatever differences we may have and do have as a trade union with President Johnson, we wholeheartedly support his statement made in connection with proposed, wide-ranging legislation to protect the health and safety of all working men and women in the United States.

President Johnson said, "Adequate protection does not exist today and further it must be our goal to protect every one of America's 75 million workers while they are on the job." He has submitted to the Congress an

"Occupational Safety and Health Act of 1968." This Act, in addition to strengthening the authority of the Secretary of Health, Education and Welfare, and the authority of the Secretary of Labor to set up and enforce certain standards, carries provisions to impose strong sanctions (civil and criminal) on those who endanger the health and safety of the American workers. The Act will provide for federal grants to help states develop plans to protect the health and safety of workers, provide safety inspectors and other experts. Enforcement provisions can be tough, with severe penalties, fines ranging from \$1,000 to \$10,000 along with prison sentences. It must be said that the State of California because of its excellent rules and regulations on safety standards will not be greatly affected (with the exception of enforcement of regulations) by the proposed federal safety act.

Of course in talking on this subject I talk as a trade unionist—a spokesman for workers generally as well as a direct representative of the members of my own union.

Their trade union organization was formed, and bears the responsibility, to protect their interests and advance their welfare in every way. Our union has always known that the reason a worker is on a job under our social system is because there is someone making a profit from his labor. The very least such a worker is entitled to—in addition to the best wages and hours and working conditions he can win through his union—are strong measures to protect his health and safety while working at tasks that make an employer richer.

Our union is well aware that no matter how well we do our job in seeking to protect our members—no matter how well the union and employers pool their experiences in efforts to prevent accidents and preserve health and safety, accidents will occur.

The very least we can do is to assure the man who must work to support himself and his family that everything possible is being done to see that he comes home with a whole and healthy body. Our objective is to keep him

that way. But if he does get hurt we also try to make sure that the best medical care and adequate compensation will be available to meet his needs.

Portable Fire Extinguishers

A recent addition to Section 13161.5 of the Health and Safety Code requires that no portable fire extinguisher shall be marketed, distributed, or sold in California unless:

"(d) It does not use as an extinguishing agent any carbon tetrachloride, chlorobromomethane, or methyl bromide, except that carbon tetrachloride may be used for the purpose of extinguishing fires on public utility poles.

"The State Fire Marshal may grant reasonable exceptions to this subdivision when the extinguisher is intended for industrial use in places to which the public is not invited or admitted."

Examinations Include Safety

For years, the examinations for registration of electrical engineers have included problems which required knowledge of the *California Electrical Safety Orders*.

The Civil Engineering examination conducted on August 19, 1967, contained a problem on safety, the answer to which was to be found in the *California Construction Safety Orders*. The weight given this problem was 25 points.

Historically, registration of engineers was instituted in order to provide safe structures, thereby preventing accidents which, in some instances, could be disastrous.

The inclusion of such safety problems is considered very important, advancing as it does the knowledge civil engineers will have of safety for workmen doing the construction work.

The Board of Registration for Civil and Professional Engineers has always considered safety as a major part of engineering, and will continue from time to time to include safety problems in its examinations.

HIGHLIGHTS OF SECTION MEETINGS AT CONFERENCE

AGRICULTURE



Jay Goold, Safety Coordinator, California Farm Bureau Federation, addressing agriculture section on topic "Why Personal Protection Is Necessary."

Presiding over the first session was John Lewis, Northern Committee Cochairman. Mr. Lewis, a young cattleman, is the Safety Committee Chairman for the California Farm Bureau Federation. A member of the Industrial Safety Board, Tony Guerrero, a "dirt farmer," moderated the subject, "*How to Develop a Farm Safety Program.*" Leadoff speaker Geo. Sherman, Assistant Chief of the Division of Industrial Safety, concluded his presentation with, "I believe the most important thing that this Agriculture Section can do is to develop a system of communication with all farmers, and teach them how to use their training and experience to recognize hazards. And, after that, list the hazards in categories as to the human behavior involved."

In "*How Your Compensation Insurance Carrier Can Help*" Paul Martin, Assistant Vice President, Pacific Indemnity Company, explained how a farmer can save money by reducing his injury rate—and how even a single serious injury can increase the premium on a policy.

Jay Goold, a dairy specialist and Safety Coordinator, California Farm Bureau Federation, by presenting his wife and their five young sons, personalized his topic, "*Why Personal Protection Is Necessary.*" He outlined his responsibility for each of the six and convincingly demonstrated to his audience that they had similar responsibilities which could not be met if they did not use personal protection to prevent injuries.

Kenneth Howell, farmer and educator, used several models to demonstrate to farmers and their employees how to recognize and correct hazards. Harry E. Weatherholt, Administrator of Personnel and Training Services, Kern County Land Company, presented "*How You Can Train Your Supervisors to Promote Safety*" by outlining his company's practice of evaluating each of their supervisors in his over-all performance, related to all the factors that go into making him a member of the management team.

As the concluding topic of the afternoon, Dr. Herbert Bauer, who is Director of Public Health for the County of Yolo, spoke on "*Preparing for Secondary Prevention*," the basis of which was, "If we practice primary prevention as faithfully as we ought to, such panels as this would happily not be necessary."

The next morning's session had for subject "*How to Keep Your Guard Up*" with Miles Kratka, a landscape contractor and Executive Secretary of San Diego Farm Bureau, as moderator. Mr. Kratka emphasized his point by showing that Goliath was injured because he dropped his guard and how David overcame him because he knew the right move to make at the correct time.

George E. Miller, Jr., Extension Rural Civilian Defense Coordinator at the University of California at Davis, illustrated his topic, "*How to Prepare for a Rural Emergency*" with color slides of

actual rural emergencies. Professor Michael O'Brien, from the same University, illustrated his talk on "*How to Guard Physical Hazards*" with slides also, and expressed his belief that "safety" means the correct way of doing things and the best approach to get people to work in a safe manner is to give them an "incentive."

"Fortunately, there are few disabling accidents that take place on our farms today involving pressure vessels; however, when these accidents do occur, they are quite serious." With these words, anchor man, Warren Wegis, Director of the Agricultural Department, California State Chamber of Commerce, opened his talk. Drawing on his experiences as a safety engineer in the oil industry, he depicted the phases of such accidents and the ultimate devastation which usually follows.

CONSTRUCTION



Left to right: E. J. Gale, Business Representative, Carpenters Union Local 316; Gary H. Bronneck, Partner, Drummond & Bronneck; Willis Pugh, Consultant; Leo R. Westwater, Vice President, Granite Construction Company; John Tennison, Consultant; Arthur T. Eisele, Business Representative, Carpenters Union Local 1506.

Jack F. Hatton, Chief, Division of Industrial Safety, spoke on the future of the Division, emphasizing that there will be no significant change in Division operations in the future. The legislature has given the Division a mandate to promulgate and enforce reasonable safety standards in order to minimize on-the-job injuries.

Senator Jack F. McCarthy of San Rafael spoke on safety and legislation. The answer to safety problems is not the passage of more legislation, but rather lies in joint efforts, such as the Governor's Industrial Conference.

The problem of motivation for safety was reviewed by William Bird, Vice President, Kaiser Industries. We must examine our operation, our methods, and ourselves and instill a dedication to excellence.

Dale Marr, Vice President, Operating Engineers Local 3, presented the current problems in safety in construction, and the path that his union is following to obtain solutions; also complete health programs for employees, and improvement of equipment at the manufacturers' level.

Ronald Smith, General Manager of Whirlwind Helicopters, Inc., described the use of helicopters in construction and outlined basic rules for using them safely.

A review of California's 1967 construction injury record—the best ever for the State—was offered by V. L. White, Assistant to the Chief, Division of Industrial Safety.

The second session was opened by B. R. Stokes, General Manager, B.A.R.T.D. He described in detail his organization's safety program

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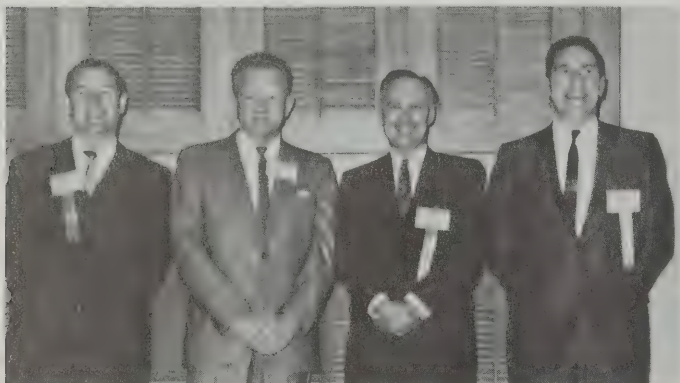
which was inaugurated in 1963, long before construction contracts were awarded. He cited many of the hazards inherent in their work, and how they have been minimized.

The need for safety training in apprenticeship programs was stressed by E. A. Brown, Director of the 42 Counties Joint Apprenticeship and Training Committee, and he illustrated how this was done in a carpentry course.

Dan Giles, Chairman of Associated General Contractors Safety Committee, stated that California's governmental efforts for safety lead those of the 49 other states, and he believes that the cooperative effort of State, management and labor is preferable to federal direction.

Section recommendations will be included in the report to be mailed to those who attended the meetings.

FOREST PRODUCTS



Left to right: Matthew A. Kuhta, Consultant; Alder Thurman, Safety Supervisor, Union Lumber Company; Vernon C. Russell, Business Agent, International Woodworkers of America Local 3-433, AFL-CIO; Thomas H. Batterton, Consultant.

The Forest Products session was opened by Reed O. Hunt, Chairman of the Board, Crown Zellerbach Corporation.

His keynote address set the tempo for a productive two-day meeting. He gave a picture of a top executive's role in accident prevention and stated that "Creating and sustaining the proper mental attitude is the first factor in safety. It is my personal conviction that any logging operation can be as accident free, or have as low a frequency rate as any other well-managed industrial operation." Crown's accident prevention progress reflects his direction.

A panel discussion, "Designing Logging and Sawmill Equipment for Safety" was moderated by Darrold Mitchell of Georgia-Pacific Corporation. Speakers were: Ted Andrianoff of Armstrong Manufacturing Company, who presented practical solutions on reduction of saw noise; Darrell Nelson, ESCO Corporation, who narrated on slides depicting log chokers with swaged fittings, safety binder releases, log grapples and the safety offered by their proper application; Will Pratt, Caterpillar Tractor Company, who indicated the problems of heavy equipment manufacture, and explained what is being done to make a safer product, including roll over protection, adequate braking systems and engine noise suppression; and Don Wood of Medford Steel, who spoke on the design and improvements in log-forks and canopies for road building and log handling equipment.

Professor Charles F. Dalziel, University of California, an authority on electrical safety, opened the second day session with a discussion on the precautions to be taken to prevent accidents when working around electrical circuits, and on the effects of electrical shock on the human body. He demonstrated the Safety Sentry, an electronic device he invented, which detects a high resistance current leakage to ground and instantly interrupts the circuit, thereby preventing fire or electrocution.

James C. Hayes, Deputy State Fire Marshal, wound up the action-packed program with, "Rescue Breathing and External Cardiac Massage," which included a film, "Pulse of Life," and a demonstration and group instruction featuring Captain Pat Alvarez of the Mountain View Fire Department.

GOVERNMENTAL AGENCIES



Left to right: Dan Hungerford, Safety Officer, East Bay Municipal Utilities District; Don Hollenberg, Safety and Training Coordinator, County of Contra Costa; Robert S. Ford, Consultant; Donald Rice, Safety Officer, City of Long Beach; Edwin Aronson, Safety Director, City of Pasadena; Duane W. Hendrickson, Consultant.

Don Hollenberg, Safety and Training Coordinator, County of Contra Costa, welcomed the 210 persons attending the first session. Robert Love of C. Robert Love and Associates, in "Communications for Safety" described some of the difficulties in communicating and the efforts made to make mental contact with a group.

"Application of Video Tape Recorders to Safety Training" was the topic of Larry Ingraham of Concord Electronics Company. A camera and television screen were used in the presentation and a demonstration was given on how a video tape recorder can be useful in safety training.

In "Safety Training for Supervisors" Arthur Frasco of State Compensation Insurance Fund, described the safety training courses for public employee supervisors. The course consists of seven two-hour sessions divided into 11 or 12 subjects.

The defensive driver training program for new cadets was discussed in "New Concepts in Defensive Driver Training" offered by Officer D. P. Montagner and Lieutenant E. E. Boswell of the California Highway Patrol Academy.

The program of the second day was opened by F. E. Emery, Personnel Director Contra Costa County, who spoke on "Safety in the Civil Service—Why Not?" The differences in safety disciplines between civil service and private enterprise were pointed out, and some of the aspects of enforcing safety in civil service employment.

A summary of the activities of this Section was given in Dan Hungerford's talk, "Review of Safety Institutes Sponsored by Governmental Agencies Section During 1967." During that year five safety programs were held, attended by about 1000 individuals. Mr. Hungerford is with the East Bay Municipal Utilities District.

Don Hollenberg, Safety and Training Coordinator of County of Contra Costa in his "Speaking of Attitudes . . ." described attitudes of employees and management toward safety programs and their implementation.

The final talk was given by Dr. Raymond Oja of State Compensation Insurance Fund on "You and Your Employees' Health." Dr. Oja presented the role of the supervisor as that of an "environmental engineer" who changes and improves the environment to the point where risks are reduced to a minimum.

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MANUFACTURING



Left to right: Horace Blinn, Vice President, Continental Can Company; Albert C. Beeson, Director of the Department of Industrial Relations; R. E. McConnell, Kaiser Steel Corporation, Fabricating Division; Henry A. Hartmann, Consultant.

Hal Shean, Educational Director, International Association of Machinists, gave the opening talk on *"Labor's Role in Educating the Worker."* The tragic toll of industrial injuries and deaths each year throughout the country illustrate the need for increased educational efforts by labor unions. He suggested more active participation in plant safety programs, community, apprenticeship and various school safety programs.

In *"Safety Education and Training Activities of the American Society of Safety Engineers,"* Karl Schulze, Standard Oil Company of California, prophesied that the safety professional of the future will need a unique and diversified type of education and training if he is to succeed. This will include specialized knowledge in physical and social sciences and schooling in the principles of behavior, motivation, communication and management.

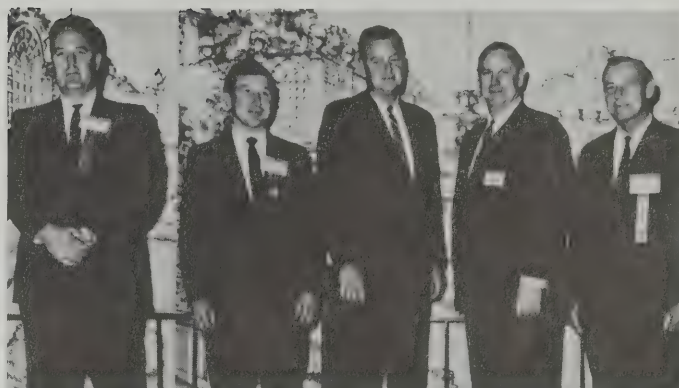
"What Can Management and Labor Do to Improve Safety?" was the topic of Homer Lambie, Kaiser Aluminum and Chemical Corporation. Frequently the investigation of an accident reveals that the hazard was not clearly recognized, underestimated, or that existing controls were not adequate. He emphasized that the safety program should be designed around the foreman-worker level with special attention given to training, motivation and control.

Albert C. Beeson, Director of the Department of Industrial Relations, opened the second session with *"California's Concern for the Safety of Workers,"* in which he enlarged on the functions of the Department, with its nine Divisions, including the Division of Industrial Safety.

"A Manufacturing Executive Looks at Safety" was the topic of Horace Blinn, Vice President of Continental Can Company. In this company safety is an important administrative responsibility, and at periodic intervals he makes reports in regard to accident prevention. He suggested a re-appraisal of job training approaches to meet new problems that may arise, such as the population explosion and influx of a young work force, and outlined steps to follow for a manufacturing concern wishing to achieve success in preventing injuries.

A fine safety training film, *"The Hand Trap Test,"* was presented by John T. McGervey of U.S. Steel Corp., Pittsburg Works. The film had been produced by U.S. Steel in an effort to reduce finger and hand injuries, these constituting almost 25 percent of their injuries. A highly interesting audience-participation quiz was part of the program.

MINERAL INDUSTRIES



Left to right: Jack L. Gordon, President Standard Materials, Inc.; Larry I. McCune, Consultant; A. L. Moody, International Representative, International Union of Operating Engineers; Dale Marr, Vice President and Safety Representative, Operating Engineers Union, Local 13; Robert D. Bailly, Consultant.

Cochairman Dale Marr, Vice President and Safety Representative, Operating Engineers Local 3, opened the meeting, and dedicated this Conference to Kyle Lutz, former Mineral Industries Consultant.

In his talk, *"Laborers' Training Program"* Warren Anderson, Administrator Northern District Council of Laborers, Santa Rosa, explained how they train men in construction skills, in training sessions of groups of 60 men, lasting six weeks, exposing them to equipment operation. In addition to various technical skills the men are taught the importance of teamwork and that each job contributes to the completed job. The program gives the trainee an equivalent of four years' experience.

Jack L. Gordon, President of Standard Materials Co., served as Cochairman for the balance of the first session.

Leo G. Connolly, Chief, Division of Labor Statistics and Research, spoke on, *"Accident Statistics and Review of Fatal Accidents in Mineral Industries."* The estimated overall 1967 accident rate declined slightly and employment decreased. Accident trends were reported for mining and petroleum industry groups. While most of the industry group rates declined, cement and clay products manufacture showed some increase, and metal mining a substantial one—indicating a need for the training of inexperienced men in accident prevention.

"Undersea Mining Methods and Hazards" was the topic of Dr. Carl Austin, Research Geologist, Naval Ordnance Test Station, China Lake. Many underground mines extend under the sea. New methods have been developed for mining in rock under the sea floor and on the continental shelf. Access to the sea floor can be from land or pressure locks on the sea floor, accessible from submersible vehicles. Lock tubes may be installed by drilling into the ocean bottom, inserting a prefabricated lock tube and cementing it in place. This tube may be deepened as necessary, and tunnels bored from this shaft. Boring appears most practical, minimizing air contamination.

The second day's session was conducted by Cochairman, Lee Moody, International Union of Operating Engineers. George J. Wolnez, Operations Safety Engineer, Aerojet General Corporation, spoke on *"Safety Motivation and You,"* in which he mentioned a number of factors involved in communication with people so as to motivate them. A survey of thousands of men indicated that workers want a meaningful job that is secure, personal safety and recognition of themselves as individuals.

Jack Spence, Assistant Manager of Safety, Standard Oil Company of California, introduced a film *"H₂S Can Kill,"* made for training men in the hazards of hydrogen sulfide, and illustrating the physical properties of it, examples of toxic quantities, locations where it might be expected, and necessary precautions.

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TRADES AND SERVICES



Left to right: Harold K. Goddard, Consultant; Bertha Metro, Secretary-Treasurer, Hotel and Club Service Workers Union Local 283; Thomas Garrett, Assistant to General Manager, San Francisco Retailers Council; Emlyn L. Cox, Consultant.

The first session was a panel discussion entitled, "Safety Problems in Trades and Services Are All Basically the Same—the Bakery Industry Has the Answers" moderated by Edward S. Keller, Continental Baking Company.

John Richards of Interstate Bakeries, in "Effective Indoctrination and Training Procedures Deter Accidents" stressed that employees be carefully selected, then trained and indoctrinated in accident-prevention. This *can* be done and *must* be done.

In, "The Manager—First or Last Link in Accident Prevention Chain?", Gene A. Nuziard of Continental Baking Company, made it clear that the Manager is the first *and* last link in providing safe operations and a safe plant, and that his plans and demands touch all the safety-links in a plant.

Carl T. Hall of Royal Globe Insurance Company, in "Productive Safety Meetings—Are Yours Productive? Here is Help!" pleaded to have energetic, not lukewarm safety meetings, that demand action from supervisors and can achieve success in safety.

Rehearse safe procedures, is what Ernest Eska of Langendorf United Bakeries urged in "Poor Planning Versus Proper Planning." Whether it's a new machine, or new operation, or a new plant—train your old and new employees thoroughly on a "dry run"—thereby avoiding injuries and spoilage of the product. It really works!

"Labor Unions Can and Will Help on the Plant Safety Program," was the theme of Al Meyer of Bakery and Confectionery Workers of America. In halls, conventions and at factories unions train their men in safety—and they teach the importance of abiding by safety rules. Give the safety-conscious worker safe machinery and operations.

Tom Larkin, Oroweat Baking Company, in his talk, "Gimmicks and New Ideas Have a Place in Your Program" emphasized that a sound safety program be established and employees be encouraged by every means to adhere to it *always*—maybe by rewarding them in various ways. Don't let them *ever* forget to work safely.

The second session offered a panel presentation, "Vehicle Safety—Delivering the Goods." The opening topic, presented by Edward S. Keller of Continental Baking Company, was "Effective Selection Must Include Investigation." Before hiring a driver, talk to him at length; get his background in some detail; then check his driving record. Make certain that he qualifies to join your fraternity of tested and outstanding drivers.

Since you know your people, you're in a position to "Tailor-Make Your Program to Your Problems" maintained Vern Stricklin, Liberty Mutual Insurance Company. If any of your people are injured, then *you* find the cause and *you* instigate corrective measures and follow up to insure they are complete. Fit your safety program to your people.

Buy good trucks and equipment, keep it clean, lubricated and treat it as a valuable baby, because, as Roy Anderson of Langendorf United Bakeries is convinced, "Vehicular Maintenance and Safety Are Inseparable."

Richard K. Wrinkle of United Parcel Service spoke on, "The Positive Thinker Behind the Wheel Guarantees Success." Management, you must think, talk and act safety; meet your men every morning and inject a dynamic, *positive* approach for better service, handling of goods, use of equipment, and performing all tasks safely! Safety is excellent economy.

Provide a sound safety program to start, then, "Welcome Creativity and New Ideas" stated John Drye of Kilpatrick's Baking Company. Recognize, promote and reward new ideas—and come up with a couple yourself now and then. Ideas, well nurtured, are productive. Be a *leader* for other men to follow.

TRANSPORTATION, COMMUNICATIONS, UTILITIES



Left to right: Ronald T. Weakley, Business Manager, International Brotherhood of Electrical Workers Local 1245; Andrew T. Brozik, Consultant; H. M. Clement, General Plant Operations Manager, Pacific Telephone & Telegraph Company; Nate DiBiasi, President and Legislative Representative, I.L.W.U.; Haril Whetsell, Consultant; Carl E. Pulliam, Engineer, Southern Gas Company.

Stewart L. Rankin, M.D. at E. I. duPont de Nemours & Co., Wilmington, Delaware, delivered a highly stimulating talk on "Safety—A Way of Life." He stressed that there must be safety *always*—on the job, on the highways and at home.

A. W. Turner, member of the Industrial Safety Board, moderated a 3-member panel presentation which included live demonstrations, covering underground utilities structures involving natural gas, and electrical hazards. On the panel were: E. B. Girdler, Southern California Gas Co.; T. L. Lease, Pacific Telephone & Telegraph Co.; and Edward Hall, Utility Workers Union of America.

The following day offered another panel discussion on "Nuclear Power Safety Controls," which was moderated by Charles Storey of Southern California Edison Co.; members of the panel were: Mark Cook, I.B.E.W. Local 1245; Hugh Reynolds, Pacific Gas & Electric Co.; and William Steffan, Division of Industrial Safety.

Numerous and varied important safety subjects were brought up by the audience of 171 individuals during the open forum period.

SAFETY CLUBS

Visible signs which attest to the fact that a man's life was saved or serious injury prevented, help to advance safety programs. Several safety clubs provide such signs in the forms of lapel pins, decals and certificates free upon application.

Our purpose here is to mention and illustrate three such clubs, and to name their current sponsors. Employers are urged to obtain membership in these clubs for eligible employees.

TURTLE CLUB

The Turtle Club was founded by C. R. Rustenmeyer of Vancouver, and with justice was named in honor of the first practitioner of safe covering for the head. The club includes people whose lives were saved due to their wearing a safety hat when struck from above by a heavy object. To members are given a lapel pin in the form of a turtle, a certificate and a decal for use on safety hats. The sponsor is E. D. Bullard Company, 2680 Bridgeway, Sausalito, California 94965.

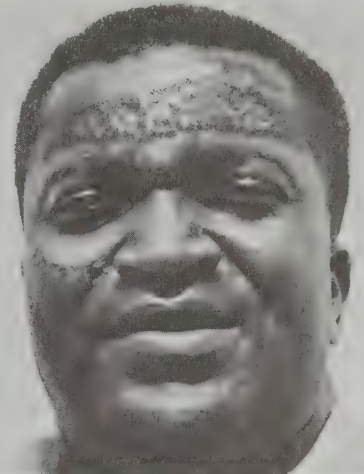


E. W. Bullard, Jr., president of Bullard Company, is shown above, presenting insignia of membership to J. R. Silveria, an employee of East Bay Municipal Utility District in Oakland. Silveria, a painter, was working at the Firetrail Reservoir in Castro Valley on October 17, 1967, when a 40-lb. block of wood, used to guide the cable of a spider staging, fell 30 feet and struck him on the head. In the background is displayed the block of wood and the safety hat, with a sign stating how the hat deflected the blow, protecting him from severe head injury.

Several other Californians joined the Turtle Club during 1967, including: George W. Williams, employed by Public Works Center, Naval Station, San Diego; William P. Cross, Jr., with Pacific Telephone and Telegraph Co., Los Angeles; J. B. Stadtmiller of Standard Oil Co. of California, Western Operations, Inc.; Bobby G. Estes, employed by Contra Costa County, Martinez; and Emilio T. Montano, with Conrock Company, Los Angeles. During 1967, 850 new members joined the club, bringing the total membership to 9600.

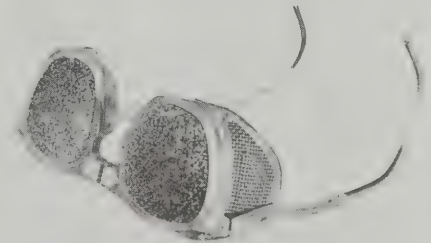
WISE OWL CLUB

A Wise Owl is an employee who saved the sight of one or both eyes due to wearing eye protection at the time an accident occurred. This club is sponsored by the National Society for the Prevention of Blindness, 79 Madison Avenue, New York, New York 10016.



Jim Lewis

Jim Lewis is a leadingman in the paint department of Bethlehem's San Pedro yard and supervises painting and shotblasting. One night, a few months ago, one of the men using a shotblast hose suddenly tripped and fell backward, with the shotblast hose in his hands. The shot struck Jim Lewis in the face. There were injuries to his right cheek, forehead, bridge of the nose, and the area near his left eye.



But his eyes completely escaped injury, because he was wearing safety glasses with sideshields. The glasses were cracked, but they did their job. Jim now refers to the shotblasted glasses as his "million dollar glasses," because they saved his eyesight.

Continued on page 14

GOLDEN SHOE CLUB

The Golden Shoe award is presented to industrial workers who have avoided foot injury by wearing safety shoes.*

The club is sponsored by Hy-Test Safety Shoes, Division of International Shoe Co., 1509 Washington Ave., St. Louis, Missouri. Requests from California employers for application forms should be addressed to either Quenvold's Safety Shoemobile, P.O. Box 328, Lafayette, California 94549, or to Industrial Safety Shoe Co., 5825 Santa Fe Ave., Los Angeles, California 90058.

Many Californians joined the club during 1967, including: James Crow, a carpenter, and Randall Schmuck, a fire fighter, both at U. S. Naval Ordnance Test Station, China Lake; C. A. Wolf, a storekeeper at United Airlines, San Francisco; and Howard D. Kosanke, reactor operations supervisor at General Electric Company's Vallecitos Nuclear Center at Pleasanton.

Since October 1958, about 9000 Golden Shoe Club awards have been presented.

* NOTE: Of special interest to carpenters, fire fighters and others subject to foot puncture injuries from nails, is a paper-thin, stainless steel insole which will bend indefinitely without cracking, and will not admit nails. Originally developed to protect U.S. infantrymen in South Vietnam against enemy needle "pungi sticks," they are available now. Supplier's name on request.

LOOK UP!

California construction leads the Nation. One of the problems faced by construction industries is the possibility of coming into contact with overhead power lines. All contractors should know how to avoid such high voltage contacts, which snuff out lives, or result in the loss of arms or legs or in serious burns.

Nearly all these injuries and deaths are due to forgetfulness or carelessness. Failure to "LOOK UP" before moving objects near power lines is the prime reason for trouble. Hence the

slogan, "LOOK UP" has been adopted to pinpoint the way to prevent such accidents.

Before starting *any* construction project, in any location, the contractor or his representative should first determine whether there is a possibility of contact with overhead high-voltage lines. If so, he should communicate with the nearest office of the serving utility and request that an engineer meet with the contractor at the job site to determine what must be done.

No two jobs are exactly the same. It may be that raising the lines is all that is needed; or it might be necessary to de-energize the lines temporarily; or possibly re-routing the power might solve the problem. The engineer will be able to advise the contractor and coordinate any work necessary on the part of the serving utility. These arrangements should be made well in advance, in order to avoid a delay in the construction work and service by the utility.

When doing construction work, it is unlawful to operate equipment within 6 feet of high-voltage lines, and it is mandatory that, "All equipment shall be positioned, equipped, or protected so that no part shall be capable of coming within 6 feet of high-voltage lines."

Section 385 of the *California Penal Code* is quoted in Bulletin S-140, "Keep Away from Power Lines!" which is available from the California Division of Industrial Safety, free upon request. Not only operators of cranes, but riggers, installers of scaffolds, painters, window cleaners and others who work at similar trades should be familiar with the Code. (See page 13, *California Safety News*, December 1967.)

If a contact should occur, keep clear of equipment or machines which may be in contact with power lines, or which may have become energized due to the contact. Call the serving utility immediately, so that it can correct the situation.

If equipment or machinery on which the operator rides contacts an overhead high-voltage line, the operator

will normally be "safe" as long as he remains on the equipment or otherwise does not simultaneously contact the earth and the energized equipment.

Most electric utility companies carry on extensive accident-prevention programs. They will gladly assist you in instructing your employees on how to avoid contacts with overhead lines.

So, whoever you are . . . wherever you work . . . if you have *any* equipment that reaches into the air . . . remember: look for power lines overhead . . . LOOK UP!

NEW HAZARDS

North American Rockwell Corporation has experimentally determined that mixtures of finely-divided barium and a number of halogenated hydrocarbons possess an explosive capability. Specifically, impact sensitivity tests have shown the granular barium in contact with monofluorotrichloromethane, trichlorotrifluoroethane, carbon tetrachloride, trichloroethylene, and tetrachloroethylene can detonate.

The U.S. Atomic Energy Commission reported a similar problem with plutonium chips exploding in a carbon tetrachloride degreasing bath which ruptured a glovebox. The Commission reported this in detail in "*Serious Accidents*," issue No. 246, March 12, 1965.

TINTED SAFETY GLASSES

There is a tendency to remove them on entering dimly lit areas, and they are a hazard if worn at night.

So, wear clear, untinted safety glasses.

If sunglasses are needed, wear them over safety glasses.

Hard Hat Area

Every longshoreman at Port Huemene has a hard hat. It is believed to be the first port on the West Coast where 100 percent of the longshoremen wear hard hats. Do you know of any other?

KYLE J. LUTZ

An Appreciation
by John C. Franz

Kyle J. Lutz of Pleasant Hill, California, died January 15, 1968, at the age of 71 after a long illness. He was born in Cripple Creek, Colorado. He attended the University of Nevada and graduated from the Massachusetts Institute of Technology in 1923 with a degree of Bachelor of Science in Mining Engineering. He was a veteran of World War I.

For a number of years he worked with the safety division of the U.S. Bureau of Mines. In 1924 he joined the safety department of the Union Oil Company, and became safety director for the Oleum Refinery in California. From 1941 on, until his retirement 25 years later, he was with the California Division of Industrial Safety, headquarters in San Francisco, as mining and petroleum safety engineer. During this time he was instrumental in the developing of the first safety code for the refining and marketing of petroleum products, and was a consultant for the Governor's Industrial Safety Conference from its inception until his retirement.

He was a member of the American Institute of Mining Engineers; the American Society of Safety Engineers; Veterans of Safety; and the Lodge of the Free Masons, Albany, California.

His hard work and dedication to safety for all workers was always mixed with good humor and kindness. For those of us who were privileged to know, work and associate with him, there can be no replacement.

He leaves his wife, Annah, his two daughters, Kathleen and Cissily, three grandchildren, and a host of friends in all walks of life.



EARL EVANS RETIRED

Information was received too late to include in the December issue that Earl Evans had retired effective November 15, 1967. Earl joined the Division of Industrial Safety on July 21, 1941. He was serving in the capacity of Senior Safety Engineer (Construction) when he retired.

He held a B.S. Degree in Engineering from Harvard University and a M.B.A. degree in Business Administration from Harvard Graduate School.

He was a member of Veterans of Safety, California State Employees Association, Harvard Society of Engineers and Scientists, Union of State Employees, Local 411, and helped to organize the Northern Industrial Safety Society.

He is currently residing at 1816 Golden Rain Road, Walnut Creek, Calif. 94529. His services are available as a consultant in construction safety matters.

The *California Safety News* is interested in obtaining usable safety information, together with pertinent black-and-white glossy photographs. If you have an idea for safety, a safety record or a safety procedure that you believe may be of value to others, please send it in. The *California Safety News* does not pay for material, but may give it worldwide distribution.

SAFETY FIRSTS

Safety pins were known to the ancient Greeks and Romans. Handmade pins similar to our present safety pins have been recovered from ruins alongside the Mediterranean.

The modern safety pin is an American invention. A patent for it was issued to Walter Hunt of New York City on April 4, 1849.

The first safety razor was made in 1880 by Kampfe Bros. of New York.

It was a modification on a straight-edge razor and was known as the Star Safety Razor. It was made from a forged blade of a type used by barbers that was inserted in a frame that minimized nicks and cuts.

One of the major hazards in coal mines is explosions from firedamp (mostly methane gas). An attempt to reduce this hazard led to one of the first safety devices.

In 1815, Sir Humphry Davy, in England, produced the first practical safety lamp.

It was an oil lamp with a fine wire mesh cylinder around it. When the wick is lowered, a pale blue flame will appear if there is firedamp in the atmosphere.

The wire mesh will contain the heat of the flame until the mesh itself becomes as hot as the flame.

Good conducting mesh will heat slowly and give the miner a chance to leave the dangerous area.

One of the leaders in the safety movement in America was the United States Steel Corporation. In 1909, the president of U.S. Steel Corporation, Judge Elbert Gary, had this to say about safety:

"The United States Steel Corporation expects its subsidiary companies to make every effort practical to prevent injury to its employees. Expenditures necessary for such purposes will be authorized. Nothing which will add to the protection of the workmen should be neglected."

This was quoted from the Accident Prevention Manual of the National Safety Council.

CALIFORNIA SETS NEW SAFETY RECORDS

Governor Reagan predicted an all-time low in California's industrial injury rate for 1967 when he addressed about 1,100 leaders of industrial safety at the Governor's Industrial Safety Conference on February 8.

His estimate was confirmed March 6 by Albert C. Beeson, Director of the Department of Industrial Relations, who stated that the first actual count of disabling work injuries in California during 1967 has been completed. The total was 195,541 including 669 fatalities. This means that the disabling injury rate per 1,000 employees reached a record low of 30.8 during 1967. The previous record, established in 1965, was 31.6.

Of equal importance is that the number of fatalities was reduced from 723 to 669, a 7½ percent decrease from 1966. Construction, lumbering and agriculture contributed a great deal to the establishment of the new low in fatalities. While calculations are not yet complete, it is estimated that each of these industries will also set all-time low injury rates.

Jack F. Hatton, Chief of the Division of Industrial Safety, pointed out that normally, with rising employment, an increase in the injury rate may be expected, due in part to lack of experience of new employees. Yet the new safety records were established while the overall employment in industries covered by California's Workmen's Compensation Act increased from 6,139,000 in 1966 to 6,324,000 in 1967, a rise of 3 percent.

Division safety engineers made over 153,000 original industrial safety surveys during 1967—again a record-breaker; in 1966 there were 144,000.

Hatton complimented California employers, stating that they had corrected over 239,000 unsafe conditions during 1967, again establishing a new record, surpassing the figure for 1966 of 226,000.

While the primary purpose of the Division of Industrial Safety is to promulgate and enforce safety regulations, Hatton is firmly convinced that more safety education is needed if we are to continue to improve our safety records. Special attention should be given to those industries having high accident rates. He stressed that the Division of Industrial Safety welcomes requests for safety surveys and for qualified speakers on safety subjects from employers, unions, and other organizations interested in industrial safety.

(Note: Address below is reversed to permit automatic feeding of the addressograph machine.)

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CALIFORNIA SAFETY NEWS

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December 1967



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173 YEARS OF SAFETY

Pictured above from left to right: Ovid L. Holmes, Senior Safety Engineer (Construction), Sacramento; John C. Franz, Senior Safety Engineer (Industrial), Oakland; Jack F. Hatton, Chief, Division of Industrial Safety; E. E. Carlton, Supervising Safety Engineer (Electrical), San Francisco; Vincent L. White, Assistant to the Chief, San Francisco; George A. Sherman, Assistant Chief, San Francisco; Andrew T. Brozik, Safety Engineer (Mineral Industries), San Francisco. The picture was taken following a presentation on October 6, 1967.

In recognition of employment with the State of California for a period of 25 years each, certificates for faithful public service, awarded by the Governor, were presented by Jack F. Hatton to Holmes, Franz, Carlton, White and Brozik. In addition, each was presented with a 25-year tie clasp.

The total state service of the five men honored by these awards is more than 125 years. George Sherman has served 26 years with the Division, and Jack Hatton has been on the Industrial Safety Board 22 years—making a combined total of over 173 years for this group.

In addition, these men had experience in safety work prior to joining the Division of Industrial Safety.

Inasmuch as this is actually a small fraction of the total safety experience available within the Division, it is indicative of the very large amount of knowledge and experience available on request to assist in solving safety problems.

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The cover picture, courtesy of the San Francisco Convention and Visitors Bureau, shows intersection of San Francisco's three cable car lines at the Fairmont Hotel, California and Powell Streets.

ERRATUM: The statement on page 14 of the July issue CSN, "Using low-flashpoint . . ." should have read "Using high-flashpoint . . ."

HOW TO PREVENT MERCURY POISONING IN THE QUICKSILVER MINING INDUSTRY

By ANDREW T. BROZIK, Safety Engineer,
Division of Industrial Safety

Mercury vapor is so toxic (poisonous) that California law requires that normal work atmosphere must not contain more than 0.10 milligram of mercury vapor per cubic meter (mg/m^3) of air. This is equivalent to *only* about one part of mercury vapor for every 100 million parts of air.

A definite mercury poisoning hazard exists in the quicksilver mining industry and in all probability will become acute unless sincere and conscientious efforts toward prevention are made by both management and the worker.

Recent governmental surveys at several mines revealed that millworkers were being exposed to excessive concentrations of mercury vapor. In addition, medical tests of 89 such workers showed that 62 had excessive absorption, of which 14 were definite cases of poisoning.

Mercury can enter the body by breathing the vapor (including smoking with contaminated hands), by breathing mercury-bearing dust, by eating mercury-contaminated food, or by absorption of mercury through the skin. Mercury vaporizes even at temperatures below freezing.

The skyrocketing market price of mercury a few years ago has increased the number of quicksilver mining operations from a handful to several dozens. Thus, many of the workers and even many operators are not sufficiently aware of the serious poison potentials and preventive measures. The operating methods at many small mines are more or less crude.

Aware of this serious health hazard, two California state agencies, the Division of Industrial Safety and the Bureau of Occupational Health, have been making surveys at these operations and also have compiled suggestive means in preventing mercury poisoning as a guide. These suggestions are as follows:

A. Processing Controls

Construct, operate and maintain all mercury mill processing equipment to control spillages of mercury and to control mercury vapor and mercury-bearing mud or dust from entering the work area. For example:

Furnace

Maintain adequate negative pressure within the furnace to prevent escape of mercury vapor through seal rings and ore feeder.

Retort

Maintain tight seals of the charge and discharge doors.

Hoe Table

Equip table with a hood enclosure and mechanical exhaust ventilation of sufficient capacity to prevent the escape of mercury vapor and dust. (Minimum air velocity of 100 linear feet per minute through the entire hood opening should be provided.)

Mercury Spills

Mercury accumulates in cracks and in porous floors. Hard, smooth, and impervious surfaces should be provided where mercury and mercury-bearing dust and mud are handled. Floors should be sloped and have gutters and drains to facilitate and control cleaning (washdowns). Mercury bottling areas should be provided with a basin to contain spillages.

Mercury Storage

Store mercury and mercury-bearing mud or dust in containers that are either airtight, have a layer of water over the material, or vented to a location outside the work area.

Exhausts

Discharge all mercury-contaminated exhaust gases from process equipment to a location where they will not re-enter work areas.



B. Personal Protection Practices

1. Provide employees with respiratory protection, acceptable to the Division, and require its use where the control of mercury vapor concentrations to within $0.1 \text{ mg}/\text{m}^3$ is impracticable and exposures are brief. Locations or operations where this condition may exist include:

- Loading, hauling, and dumping hot rock;
- Manually washing down and cleaning out condensers;
- Loading and unloading retorts;
- Loading and unloading hoe tables;
- Other handling of dust and mud;
- Bottling mercury;
- Maintenance and repair operations on equipment contaminated with mercury or mercury-bearing mud or dust.

2. When filter-type respirators are provided, each employee shall have one for his own exclusive use. Provide means for cleaning respirators and, when not in use, store them in reasonably dust-tight containers.

3. Use suitable hand protection such as smooth, impervious, and durable gloves when engaged in operations where there is hand contact with mercury or mercury-bearing mud or dust. Such operations include:

- Manually washing down and cleaning out condenser systems;
- Manual handling of mercury and mercury-bearing mud or dust;
- Loading and unloading hoe tables;

Continued on page 10

SAFETY IN JOB HOT-DIP GALVANIZING PLANTS

By GARRY W. JEWETT, JR., Safety Engineer,
Division of Industrial Safety

Although the number of workmen employed in hot-dip galvanizing work is not great, the injury frequency is relatively high and the injuries suffered are quite severe.

The financial loss to companies engaged in hot-dip galvanizing, as indicated by the manual rate for workmen's compensation insurance, is well above average.

A review of doctors' reports of injury for the years 1965-1966 may be summarized as follows:

Foot Injuries

A total of 33 foot injuries accounts for 25.8 percent of 128 injuries during 1965-1966. The wearing of safety shoes could have prevented nearly all of these.

Four men suffered severe foot burns from molten zinc. They were all wearing open top boots with their trouser legs tucked inside. Hoisting equipment slipped, causing the work being galvanized to splash zinc out of the kettle, in one case. In another, drips from pieces being removed from the kettle caused the burns. An explosion in the kettle threw molten zinc over two men. Wearing open-top (slip-on) boots should be prohibited.

The insurance costs in each of these four cases ranged from about \$2,500 to more than \$13,000, indicating the severity of these injuries. In addition, each of the four men burned suffered financial losses, even though they received maximum benefits from workmen's compensation insurance.

Back Injuries

Back injuries accounted for 19 of the injuries reported, or 14.8 percent. These resulted primarily from manual lifting of material to be galvanized.

Greater use of material-handling equipment would seem to be indicated in preference to manual lifting. Where manual lifting is still necessary, employees should be instructed in proper lifting techniques.

Hand Injuries

Injuries to hands were generally due to getting caught between pieces being moved, and they were 14.1 percent of the total.

Two resulted from electrical burns.

Doctors' reports do not indicate any failure to wear gloves as a cause of these injuries.

Eye Injuries

There were nearly as many injuries to the eyes as to the hands—12.5 percent.

Four men had acid or caustic splashed into their eyes. A fountain-type eyebath is required in these severe exposures, for immediate and gentle washing of eyes splashed with irritants. The control valves should be operable by the feet, or in such a manner as to leave the hands free. The eyelids should be held apart during the flushing which should be continued for at least 15 minutes. While the use of a water hose or faucet is better than nothing, it is not adequate where there is regular or frequent exposure. Immediate medical attention should, of course, follow the flushing.

Four men got molten zinc burns from splashes or explosions in the kettle. One had his face shield up. There is no mention that the others had eye protection except for one man whose eyes were saved by the safety goggles he was wearing; his burns were around the eyes.

The use of a full face shield which permits adequate circulation of air to prevent "fogging" should be mandatory.

Leg Injuries

Injuries to the legs accounted for 12 of the injuries, or 9.4 percent of the total. In nearly every instance these were a direct result of poor housekeeping which caused slips and falls, being struck by material or bumping into material.

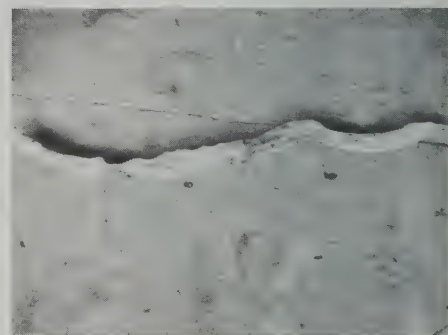


Head and Arm Injuries

Head injuries totaled 8, or 6.2 percent; injuries to arms were 7, or 5.5 percent. Injuries to the head were generally due to poor housekeeping; those to the arms were acid burns from the pickling tank solution.

Miscellaneous

Fifteen injuries, which accounted for 11.7 percent, involved upper parts of the body. They were the result of minor explosions in the kettle which popped molten zinc onto the men. Manual handling of material with subsequent injuries from being struck by pieces or by falling accounted for many of the others.



This Tube (6' x 1" x 1") Exploded

Fabricators must be positive that pieces to be galvanized are properly constructed to avoid entrapment of moisture, pickling solutions, grease or air. Galvanizers should refuse to accept improperly constructed items.

The difference in weight of metal to be galvanized and that of the molten zinc bath is so slight that entrapment will cause most pieces to float. Kettlemen seeing any piece, such as this tube, float, must remove it from the kettle immediately.

Safety Showers

Quick-acting safety showers are necessary wherever exposure to sulfuric acid is regular or frequent—as in this industry. The shower should be fitted with a quick-acting valve, such as might be operated by a grating when a person steps on it. The shower head must be large, providing an adequate volume of water to completely drench the individual. A hose or ordinary showerhead is considered substandard, but of use in an emergency. Contaminated clothing should be removed under the shower and water must be applied until all traces of the acid have been washed away.



Personal Protective Equipment

Includes safety hat, face shield, aluminized fiberglass smock, sleeves down and buttoned, gloves, cuffless trouser legs outside safety shoes. (CAUTION—The aluminized smock can reflect arc welding flashes into the eyes.) A welders jacket might be used. Kettlemen should wear heavy clothing above the waist, adequate to protect against spattering of zinc.

Material Handling Equipment

Failure of hoisting equipment contributed to burns by acid and by hot metal. These were surprisingly few. However, this should not detract from the importance of supervision and training of workmen in selection and use of material handling equipment. Also routine inspections to prevent failures must not be relaxed.

Housekeeping

Poor housekeeping contributed to so many of the injuries that it should be considered to be one of the principal causes.



Barrier Protects Kettleman

While lowering work into the kettle, and until the danger of an explosion has passed, standing behind a barrier furnishes protection against molten zinc.



A Safe Sulfuric Acid Storage Tank

A tank is vented to the atmosphere through the roof. An overflow pipe prevents acid going up the vent. There are double valves on all outlets of pipe lines. A catch basin is constructed under the tank with the same capacity as the tank; the bottom is lined with limestone to neutralize spills or leaks. Warning signs are posted on the tank and at each outlet valve.

Personal protective equipment is provided for men handling the acid.

Summary

The hot-dip galvanizing industry can improve its safety record. Financial losses can be reduced. The foregoing review of doctors' reports of injuries over a brief period of two years points the way.

California Certified Boiler and Elevator Inspectors' Association Conference Meets in San Francisco January 23-25, 1968

This conference will be held at Del Webb's TowneHouse in San Francisco. It is held under the auspices of the Division of Industrial Safety.

William McCosh of the Hartford Steam Boiler Inspection & Insurance Co., 230 California Street, San Francisco 94111, will be the general chairman. Chauncey Weisman, Division of Industrial Safety, 3460 Wilshire Boulevard, Los Angeles 90005, is the vice chairman. Mr. Weisman will advance to general chairman of the 1969 meeting in Los Angeles.

Mr. Jack F. Hatton, Chief of the Division of Industrial Safety, will deliver the keynote address at 10 a.m. on January 23, 1968. The program will cover technological advances in construction and operation of elevators and pressure vessels.

Further information can be obtained from Mr. McCosh, Mr. Weisman or Mr. Perlee, Division of Industrial Safety, P.O. Box 603, San Francisco 94101.

PROTECTION OF YOUR LOW-PRESSURE HEATING BOILERS AGAINST OVERPRESSURE

By N. O. BURGESS, Safety Engineer
Division of Industrial Safety

The potentially destructive energy stored in low-pressure heating boilers, verified by some catastrophic failures of such boilers a few years ago, again directs our attention to the need for adequate controls properly maintained to permit safe operation.

With that in mind, the Division of Industrial Safety's regulations were revised (effective date December 2, 1966) to now require basically two sets of controls, known as operating controls and safety controls, on automatically operated low-pressure heating boilers.

The function of the *operating controls* is to maintain the pressure and/or temperature within desired and preset conditions, to maintain the water level in the boiler at or above the operating level, and to prevent fuel from being admitted to the burners unless there is an adequate pilot flame or other device to ignite the fuel.

The *safety controls* function to stop fuel supply to the burner if one or more of the operating controls malfunction. It is required that the operator reset either the control or the control system before the fire can be restarted after being shut down by any of the safety controls. This alerts the operator that one of the operating controls has malfunctioned and requires correction. The cause of malfunction should, of course, be determined and corrected before returning the boiler to service.

A study of past boiler accidents indicates that low-pressure heating boilers are the agency involved in many injuries and some fatalities.

Overpressure and resulting explosion is the primary cause of catastrophic-type boiler accidents. The cause of overpressure is invariably twofold: failure of one or more automatic controls to function properly, followed by failure of the spring-loaded safety valve to limit the pressure rise. The safety valve either does

not open or it opens and is of insufficient relieving capacity to handle the heat output of the boiler. One cause of a stuck safety valve is scale buildup around the disc from leakage. Hot water boiler safety valves are particularly prone to this trouble since the evaporated water will leave a higher proportion of scale.

Recent tests at Ohio State University* have exposed a heretofore unrecognized shortcoming of the conventional spring-loaded safety valve when used on hot water boilers. All existing hot water safety valves are required by the recognized ASME Code to be discharge capacity rated in terms of saturated steam. The Ohio State tests found that if the valve relieves superheated water (above 212°F.), the energy-relieving capacity of the valve drops off rapidly. This is so-called two-phase flow where part of the water flashes to steam at the safety valve seat due to the reduction in pressure. In other words, the energy-relieving capacity for a flashing fluid is uncertain.

Under some conditions of runaway fires under hot water boilers this situation of a safety valve discharging a flashing fluid can and does exist.

As stated earlier, the new devices required by the December 1966 revision of the California "Boiler and Fired Pressure Vessel Safety Orders" should provide controls necessary for reasonable safety. However, the added safety controls, having electrical and mechanical components along with the actuated fuel valve that may malfunction, are, of course, subject to failure if not properly maintained.

The spring-loaded safety valve, with the lifting lever, is the final overpressure protection. It must be ASME stamped and rated, of reliable manufacture, be test lifted at appropriate intervals, have proper pressure setting, and adequate energy-relieving capacity for the worst phase condition of the fluid.



Rupture discs, now used on other types of pressure vessels, have been proposed as "last resort" overpressure protection for boilers. They have the advantage of failing safe under corrosive attack and not being subject to binding or sticking. Because they can not be reset (an advantage in one sense) and because of other operating problems that may develop with their use, it is not mandatory that these devices be installed on low-pressure heating boilers in California.

The state "Boiler and Fired Pressure Vessel Safety Orders" require that all boilers, including low-pressure heating boilers, shall be under the direct supervision of a responsible person who shall be responsible for (1) safe operation of the boiler by a competent attendant and (2) proper maintenance of the boiler and its appurtenances.

Adequate boiler attendance, inspection and maintenance should be an integral part of the organization safety program. In particular, this should include inspection of the operating and safety controls. For example, there should be a regular time schedule for hand lifting the boiler safety valves. Written logs, dated and initialed, should be kept of the inspection, testing and maintenance done on each boiler.

The "Boiler and Fired Pressure Vessel Safety Orders" are available from the Office of Procurement, Documents Section, P.O. Box 20191, Sacramento 95820. The price is 75 cents plus 4 cents tax.

* "Initial Study of Two-Phase Flow Through Safety Relief Valves," Owen E. Buxton, Ohio State University.

TOXIC SUBSTANCES EXPOSURE LIMITS AND CONTROLS

Threshold Limit Value

The threshold limit values are concentrations of airborne toxic substances to which nearly all workers may be exposed day after day without harm. Substances which do not exceed these value limits may cause discomfort to susceptible persons and may even aggravate preexisting ailments, but nevertheless, these small controlled concentrations of airborne contaminants can generally be tolerated in an employment environment and be considered reasonably safe.

In the United States the threshold limit values adopted by the American Conference of Governmental Industrial Hygienists are well accepted, and represent a consensus of informed opinion on good industrial hygiene practice.

In general, these airborne concentrations are meant to be averaged over a normal workday; but this cannot be done with safety in all cases. There are some substances for which high concentrations for even short periods of time are extremely dangerous. In the last few years, some of the threshold limit values have been assigned ceiling or "C" values, which means that the value listed must not be exceeded, actual concentrations being consistently maintained below the listed value. In determining the necessity for a "C" value, exposures above the listed values for periods of up to 15 minutes are evaluated; and if they result in (a) intolerable irritation, (b) chronic or irreversible tissue change, or (c) narcosis to a degree that will increase accident-proneness, impair self-rescue, or materially reduce work efficiency, a "C" value is assigned. The maximum concentration permitted above the average value where no ceiling is stated is a factor of 3 for low-threshold limits (below 1 ppm) and is gradually reduced to a factor of only 1.25 for high limits (above 100 ppm). It is necessary, therefore, to know both average and maximum concentrations for proper evaluation.

By WILLIAM W. STEFFAN, Senior Health Physicist,
Division of Industrial Safety



The ACGIH has tried to stay away from terms such as "allowable," "permissible," or "maximum acceptable concentration," because they give the connotation of legal regulations; and the ACGIH feels that the objectiveness of a voluntary professional association could be damaged by such connotations. The MAC's or maximum acceptable concentrations as they appear in the California General Industry Safety Orders are really quite similar to the threshold limit values described, except that they have the effect of law.

The professionals in the field of industrial hygiene and toxicology do not universally agree on the general concept of using a quantitative value as the complete and final answer to the control of harmful exposure of airborne contaminants. But the broad diversification in the field of occupational health and safety employs many specialized professional disciplines in medicine and engineering, and the availability of definitive quantities aids those whose work is in engineering design. The medical professional and the safety engineer also find these numbers useful.

Development of Threshold Limit Values

It has only been in the last 20 to 25 years that any degree of unanimity has existed regarding acceptable concentrations. In 1943 the U.S. Public Health Service published a manual

containing a list of values. In 1947 the ACGIH published a list in the *Industrial Hygiene Newsletter*. Since 1950 the ACGIH list has been published in a scientific journal and has been generally accepted.

Henry Field Smyth, Jr., Ph.D., in an article in the June 1956 *American Industrial Hygiene Association Quarterly* describes 238 toxic substances, and makes judgments on their most important effect upon inhalation at the threshold limit value. He also states the effect of exposure at 2 and at 10 times the threshold limit value. This article is very valuable as a quick reference, even though there has been some adjustment of values in the last 10 years.

The American Conference of Governmental Industrial Hygienists periodically publishes a *Documentation of Threshold Limit Values*, the latest being a 1966 issue. Limits are based on human exposure where such is available and on animal studies where human exposure is not available. Some of the categories considered are as follows:

(1) *Chronic toxicity*, in which a progressive systemic injury occurs in a cumulative manner, increasing in severity with continuing exposure. Substances like lead, benzene, carbon tetrachloride, and carbon disulfide are typical.

(2) *Acute toxicity*, in which systemic injury occurs as a result of a short-time excessive exposure or not at all. Typical are substances like carbon monoxide and hydrogen cyanide.

(3) *Narcosis*, in which exposures for eight hours above the threshold limit value produce detectable effects on judgment or reaction time. At concentrations well above the threshold limit value, anesthesia and even death may occur. Substances like ethyl alcohol, ethyl ether, and gasoline are typical.

NOTE: For the above three categories, extreme care should be taken not to exceed allowable standards.

Continued on page 10

Governor's Industrial Safety Conference

San Francisco, February 7 - 8

Albert C. Beeson, Director of the Department of Industrial Relations and general chairman, will call the general assembly of the 18th annual Governor's Industrial Safety Conference to order at 10 a.m. Wednesday, February 7th, at the Fairmont Hotel, San Francisco.

Registration will commence at 7:30 a.m. in the main lobby in order to accommodate over 1,500 persons expected to attend.

Jack F. Hatton, Chief of the Division of Industrial Safety, will follow with conference announcements and general remarks.

The purpose of the conference, as always, is to reduce occupational injuries. The theme of the conference will be "Education." Top-level management and labor representatives will try to find ways, in addition to engineering and enforcement, to reduce accidents and injuries through education.

The principal speakers at the general assembly will be Glenn T. Seaborg, Chairman of the Atomic Energy Commission, and Harry Bridges, President, International Longshoremen's and Warehousemen's Union.

Section Programs

The conference will adjourn during the noon hour, resuming at 1:30 p.m., dividing into eight sections in order to better study the problems of the various industries. The sectional programs are shown on the opposite page. In addition, programs will be available at the conference.

Governor's Luncheon

The highlight of the final day will be an address by the Honorable Ronald Reagan, Governor of California, at a luncheon meeting at 12 noon, February 8th.

Tickets for the luncheon, to be held in the Grand Ballroom, are \$5.75 each, including tax and tip. They may be

obtained by writing to GISC Headquarters, Room 7224B, 455 Golden Gate Avenue, San Francisco 94102, and enclosing a check or money order made out to "GISC Luncheon." After January 26, tickets will not be mailed out, but held for you at the "will-call" desk at the conference.

Reserved tables for specific groups will be arranged only for groups of 10 persons (or multiples of 10), accompanied by a remittance for the exact amount.

Hotel Reservations

The Fairmont Hotel has reserved a block of rooms for persons attending the conference. Those desiring to stay at the Fairmont are advised to make reservations with the hotel direct, without delay, and state that they will be attending the conference.

Educational Publications

A special display has been prepared by Marjolaine O'Neill, graphic artist, Department of Industrial Relations. In addition to the publications listed on pages 13-14 of this issue, publications of the Division of Labor Statistics and Research will be available for those desiring copies.

Special Message Center

Pacific Telephone will install a message center for the convenience of those at the conference. Attendants will be on duty from 9 a.m. to 5 p.m. on February 7th and from 9 a.m. to 3 p.m. on February 8th.

They will post the names of those receiving messages.

The message center booth phone number will be (area code 415) 781-4300.

Inquiries

Inquiries regarding the conference may be made in San Francisco to Sewell A. Knapp, Conference Coordinator (phone: 557-2327).

In Los Angeles, to McKay Mitchell, Assistant Coordinator (phone: 432-8443).

AGRICULTURE SECTION

Wednesday, February 7—1:30 p.m.

How to Develop a Farm Safety Program

Moderator: Anthony Guerrero, Member of Board, Division of Industrial Safety

Recognizing and Listing Hazards

George A. Sherman, Assistant Chief, Division of Industrial Safety, San Francisco

How Your Compensation Insurance Carrier Can Help

Paul Martin, Assistant Vice President, Pacific Industrial Insurance Company

Why Personal Protection Is Necessary

Jay Goold, Safety Coordinator, California Federation of Labor Unions

How You Can Make and Use Simple Models

Kenneth L. Howell, Educator and Farmer, Ventura County

How You Can Train Your Supervisors to Recognize Hazards

Harry E. Weatherholt, Administrator, Training Services, Kern County Labor Council, Bakersfield

Preparing for Secondary Prevention

Dr. Herbert Bauer, Director of Public Health, Yolo

Thursday, February 8—9:00 a.m.

How to Keep Your Guard Up

Moderator: Miles Kratka, Landscapist, Riverside

How to Prepare for a Rural Emergency

George E. Miller, Jr., University of California Extension Rural Civilian Defense Coordinator

How to Guard Physical Hazards

Dr. Michael O'Brien, Professor, Department of Industrial Engineering, University of California

Putting the Pressure on Containers Safely

Warren Wegis, Director, Agricultural Department, California State Chamber of Commerce

CONSTRUCTION SECTION

Wednesday, February 7—1:30 p.m.

Division Plans for the Future

Jack F. Hatton, Chief, Division of Industrial Safety

Safety and Legislation

Senator John F. McCarthy, San Rafael

Motivation for Safety

William Bird, Vice President, Kaiser Industries

Workable Union Safety Programs

Dale Marr, Vice President, Operating Engineers

Thursday, February 8—9:00 a.m.

Bay Area Rapid Transit District Safety Program

B. R. Stokes, General Manager, BART

Safety in the Apprenticeship Program

E. A. Brown, Director, 42 Counties Joint Apprenticeship and Training Committee

The Construction Accident Picture in California

Vincent L. White, Assistant to the Chief, Division of Industrial Safety

Presentation of Committee Recommendations

FOREST PRODUCTS SECTION

Wednesday, February 7—1:30 p.m.

A Top Executive Looks at Safety

Reed O. Hunt, Chairman of the Board, Crown Corporation

Designing Logging and Sawmill Equipment

panel discussion

Outline of Section Programs at Forthcoming GISC

Thursday, February 8—9:00 a.m.

Electrical Safety

Charles F. Dalziel, Professor Emeritus, Electrical Engineering, University of California, Berkeley

Rescue Breathing and External Cardiac Massage—demonstration and film with group instruction

James C. Hayes, Deputy State Fire Marshal, Eureka

MANUFACTURING SECTION

Wednesday, February 7—1:30 p.m.

Safety Education and Training Activities of the American Society of Safety Engineers

A. C. Blackman, Managing Director, A.S.S.E.

Labor's Role in Educating the Worker

Hal Shean, Educational Director, International Association of Machinists

What Can Management and Labor Do to Improve Safety?

Homer Lambie, Safety Director, Kaiser Aluminum and Chemical Corporation

Thursday, February 8—9:00 a.m.

California's Concern for the Safety of Workers

Albert C. Beeson, Director, Department of Industrial Relations

A Manufacturing Executive Looks at Safety

Horace Blinn, Vice President, Continental Can Company

"The Hand Trap Test"—a film and safety quiz with audience participation, on preventing finger and hand injuries.

United States Steel Corporation

MINERAL INDUSTRIES SECTION

Wednesday, February 7—1:30 p.m.

Laborers' Training Program (with film)

Warren Anderson, Administrator, Manpower Development Training Act, International Laborers' Union, Santa Rosa

Accident Statistics and Review of Fatal Accidents

Leo G. Connolly, Chief, Division of Labor Statistics and Research

Undersea Mining Methods and Hazards

Dr. Carl Austin, Research Geologist, Rock Site Research Program, Naval Ordnance Test Station, China Lake

Thursday, February 8—9:00 a.m.

Safety Motivation and You

George J. Wolnez, Operations Safety Engineer, Aerojet General Corporation, Sacramento

"H&S Can Kill"—a film

Jack Spence, Assistant to Manager of Hygiene and Toxicology, Standard Oil Company of California

TRADES AND SERVICES SECTION

Wednesday, February 7—1:30 p.m.

Safety Problems in Trades and Services Are All Basically the Same—the Bakery Industry Has the Answers—a panel presentation

Moderator: Edward S. Keller, Regional Personnel Director, Continental Baking Company

Effective Indoctrination and Training Procedures Deter Accidents

John Richards, Director of Sanitation and Safety, Interstate Bakeries

The Manager—First or Last Link in Accident Prevention Chain?

Gene A. Nuziard, Manager, Continental Baking Company, Sacramento

Productive Safety Meetings—Are Yours Productive? Here Is Help!

Carl T. Hall, Senior Engineer, Royal Globe Insurance Co.

Poor Planning Versus Proper Planning

Ernest Eskla, Regional Engineer, Langendorf United Bakeries

Labor Unions Can and Will Help on the Plant Safety Program

Al Meyers, Vice President, Bakery and Confectionery Workers of America

"Gimmicks" and New Ideas Have a Place in Your Program

Tom Larkin, General Operations Manager, Orowheat Baking Company

Thursday, February 8—9:00 a.m.

Vehicle Safety—Delivering the Goods—a panel presentation Effective Selection Must Include Investigation

Edward S. Keller, Regional Personnel Director, Continental Baking Company

Tailor-Make Your Program to Your Problems

Vern Stricklin, Loss Prevention, Liberty Mutual Insurance Company

Vehicular Maintenance and Safety Are Inseparable

Roy Anderson, Vehicular Supervisor, Langendorf United Bakeries

The Positive Thinker Behind the Wheel Guarantees Success

Richard K. Wrinkle, District Safety Manager, United Parcel Service

Welcome Creativity and New Ideas

John Drye, Sales Manager, Kilpatrick's Baking Company

TRANSPORTATION, COMMUNICATIONS, UTILITIES SECTION

Wednesday, February 7—1:30 p.m.

Report of Transportation, Communications and Utilities Activities

Safety—A Way of Life

Stewart L. Rankin, M.D., E. I. du Pont de Nemours & Company, Wilmington, Delaware

Working in Underground Structures—a panel presentation

Moderator: A. W. Turner, Industrial Safety Board Member, Division of Industrial Safety

Blue Energy

E. B. Girdler, Southern California Gas Company

Substructure Explosion Demonstration

T. L. Lease, Pacific Telephone & Telegraph Company

Protection Provided Workmen by the State Safety Orders

Edward Hall, Utility Workers Union of America

Thursday, February 8—9:00 a.m.

Nuclear Power Safety Controls—a panel discussion

Moderator: Charles Storey, Southern California Edison Company

Mark Cook, International Brotherhood of Electrical Workers, Local 1245

Hugh W. Reynolds, Pacific Gas & Electric Company, San Francisco

William W. Steffan, Division of Industrial Safety

Open Forum

GOVERNMENTAL AGENCIES SECTION

Wednesday, February 7—1:30 p.m.

Communications for Safety

Robert Love, C. Robert Love and Associates

Application of Video Tape Recorders to Safety Training

Larry Ingraham, Concord Electronics Company

Safety Training for Supervisors

Arthur Frasco, State Compensation Insurance Fund

New Concepts in Defensive Driver Training

Lieutenant G. W. Clemons and Sergeant Robert Phillips, California Highway Patrol Academy

Thursday, February 8—9:00 a.m.

Safety in the Civil Service—Why Not?

F. E. Emery, Personnel Director, Contra Costa County

Review of Safety Institutes Sponsored by Governmental Agencies Section During 1967

Dan Hungerford, East Bay Water

Speaking of Attitudes . . .

D. R. Hollenberg, Contra Costa County

You and Your Employees' Health

Raymond Oja, M.D., State Compensation Insurance Fund

Mercury Poisoning

Continued from page 3

d. Charging retort and furnace with mercury-bearing dust;

e. Maintenance and repair of equipment involving mercury and mercury-bearing mud or dust.

C. Housekeeping

1. Clean up all spillages of mercury and mercury-bearing mud or dust *without delay*. This may be done by the use of a suitable vacuum cleaner, by washing down the area, or by other suitable methods.

2. Wash down mill floors as needed.

3. Apply mercury-deactivating solution to floors and other surfaces which become contaminated. (Information on this solution can be obtained from the Division of Industrial Safety or Bureau of Occupational Health.)

4. Clean contaminated work implements when necessary.

D. Personal Hygiene

1. Work clothes and shoes of all millworkers should be changed and a shower taken before leaving the job-site at the end of each shift. Adequate facilities for clothes changing and showering should be provided.

2. Separate work clothing worn by persons exposed to mercury from other persons' work clothing and from street clothing. Work clothes should be hung up in baskets or other open-type method since closed lockers can become contaminated with mercury vapor.

3. Provide laundry facilities to wash work clothes of all millworkers. Work clothes should be frequently washed. Clothes contaminated from spills or other mishaps should be removed without delay and washed.

4. Provide an uncontaminated area near the mill for cleaning and maintenance of personal protective equipment.

5. Food and tobacco, stored or consumed in the mill, may be contaminated by mercury vapor and mercury-bearing dust settling out from the air or by the handling with mercury-contaminated hands. To reduce the hazard of eating contaminated food or smoking contaminated tobacco, the storage and use of food or tobacco in the mill area should be discouraged.

6. Wash hands thoroughly before either eating or smoking.

E. Detection for Mercury Vapor

1. Frequent tests for mercury vapor, using a suitable detecting device, of the work atmosphere and for possible leaks in processing equipment should be conducted to insure employee protection against mercury vapor exposure at all times.

F. Medical Surveillance Program

1. To protect the health of employees who are normally exposed to mercury vapor, the employer should engage the services of a licensed physician. The purpose of the program is to prevent mercury poisoning to employees by detecting early evidence of mercury absorption. The interval between examinations should be decided upon by the physician. The physician's recommendations should be followed.

2. The source of employee mercury exposure should be corrected without delay to prevent additional poisoning. Effective controls of mercury vapor exposure to employees will reduce the frequency for employee medical examination and thus reduce the cost.

3. The name and address of the physician should be supplied to the State Department of Public Health, Bureau of Occupational Health, 2151 Berkeley Way, Berkeley 94704, who will be glad to assist the physician with the medical program.

If You Move—

If you move, and wish to continue receiving the CSN, please notify us of your new address.

Toxic Substances

Continued from page 7

(4) *Irritation*, in which low concentrations irritate the eyes, nose, and throat; moderate concentrations irritate the bronchi, and high concentrations may cause fatal lung edema. The threshold limit values are set at levels that do not irritate unhardened subjects; fluctuations can be tolerated for short periods of time provided care is taken not to exceed concentrations which may injure the lungs. Substances like the aldehydes, halogens, and acids are typical.

(5) *Asphyxiation*, in which substances which are inert in the body cause injury at extremely high concentrations by excluding oxygen. Where threshold limit values are set for these substances, usually 1,000 ppm is used. It is assumed that if the concentration is not held below this level there is no control, although from a toxicological standpoint a higher level might be justified. Typical substances are the freons and nitrogen.

(6) *Carcinogens*, in which cancer is developed in various sites in the body. Substances such as nickel carbonyl, which has been shown to cause respiratory tract cancer, and materials such as benzidine and naphthylamine, which show high incidence of bladder tumors, should be controlled so as to eliminate the inhalation of any concentration at all if it can be avoided.

(7) *Allergens*, in which an appreciable proportion of exposed workmen will be sensitized. Very low concentrations will sensitize a susceptible workman or injure a previously sensitized one. Any unnecessary exposure to allergenic materials should be avoided. Substances like TDI (toluene diisocyanate) and ethyl diamine are typical.

Control Methods

(1) *Substitution*—It is often possible to change the toxic substance to a material that is less toxic, or less volatile and hence easier to control. The process can often be changed to

WORK INJURIES IN NURSING HOMES AND CONVALESCENT HOSPITALS

The rapidly increasing population, more elderly persons, smaller homes, and changing attitudes of family living have contributed to a rapid increase in the number and size of California's nursing and convalescent homes. Between 1962 and 1966, the number of persons employed in institutions of this type has more than doubled.

The basic manual workmen's compensation rate for convalescent hospitals is more than half again as high as that for general hospitals, indicating that injuries to these employees is a serious problem.

A study recently published by the California Division of Labor Statistics and Research analyzed the lost-time injuries to these employees.¹ The results of that study are summarized here in order to indicate which employees are being injured, the types of injuries suffered and how to reduce the number that are occurring.

Nurses' aides sustained 60 percent of all lost-time injuries. Kitchen employees, including cooks and their helpers, represented the second largest group; they suffered 12 percent of the injuries. The nursing staff, including registered nurses, licensed vocational nurses, and practical nurses accounted for a total of about 14 percent; the

housekeepers, maids, janitors and maintenance men only 9 percent, and the laundry workers less than 2 percent of the injuries reported.

The greatest single source of employee injury was strain or overexertion in handling patients. This may be minimized by three accident prevention measures: (1) provision of adequate training in proper lifting techniques, (2) requiring that an employee seek the assistance of another employee before attempting to lift or

¹ "Work Injuries in California," IA-204, March 1967. Note: Statistical tables on disabling work injuries to employees in convalescent and rest homes are available upon request from the Division of Labor Statistics and Research, P.O. Box 965, San Francisco 94101.

Continued on page 12

reduce hazardous concentrations; for instance by airless spraying instead of conventional spraying, thus reducing the quantity of solvent; dipping instead of spray painting; using garnet, walnut hulls, or steel shot instead of silica sand for sandblasting; and methyl chloroform can sometimes be substituted for carbon tetrachloride.

(2) *Confinement and isolation*—It is often possible to enclose or isolate an operation so the operator can perform necessary tasks while in a clean environment. Examples are glove boxes for radioactive materials, dry boxes under negative pressure, fume hoods, and sandblast booths.

In handling explosives or extremely toxic substances, remote locations and minimum occupancy can be used to reduce the severity of injuries and accidents.

(3) *Local exhaust ventilation*—Probably the most useful method of control is to collect and remove the toxic substance at the point of generation or release. In most cases the amount of air needed for properly designed local exhaust systems is much lower than dilution air requirements, and the control of the plant environment is better because the toxicant is removed and not just diluted to a tolerable level.

Releasing a product into the environment can be costly, and at times a collection system which reduces plant effluent will pay off by saving the product; however, with the advent of air pollution standards, local exhaust collection methods using relatively small quantities of air may provide additional savings by reducing quantity of air that must be cleaned.

(4) *Dilution ventilation* — General ventilation is desirable and necessary in most plants where small quantities of smoke, fumes, and vapors are released in nonrepetitive operations. Where there is more or less continuous use of toxic materials it is necessary to avoid several errors commonly made in attempting dilution. A fan in a window may move sufficient air to dilute the toxic substance; but if a door or window is open nearby, the air may be pumped around a small circle and thus have no effect on the toxicant. Sometimes the concentration at a work station is too high even with sufficient air sweeping the entire room because most of the dilution air misses the work station, and the contaminant may be carried through the breathing zone of the operator before it is diluted.

(5) *Respiratory protection* — Four general types of respirators are (a) dust filters, (b) chemical cartridge gas masks and respirators, (c) airline respirators and hose masks, and (d) self-contained breathing apparatus.

The chemical cartridge gas masks and respirators are designed for short-term emergency operation. They are approved only for limited concentrations—the respirators for 1,000 ppm for organic vapors, and the gas masks for up to 20,000 or 30,000 ppm (2 or 3 percent). At the maximum approved concentrations, however, masks may be effective for as little as 10 minutes operation. Dust filters, airline respirators, hose masks, and self-contained breathing apparatus are other forms of personal respiratory protection. All of this type of protection has a useful place in industry, but can only be given brief attention here. A complete discussion of personal protective respiratory equipment is a subject in itself and perhaps worthy of a separate article.

In conclusion, it is desired to stress the necessity for strong educational projects to acquaint the working population with the hazards to which they may be exposed and in the proper methods and equipment by which they can be protected.

Nursing Homes

Continued from page 11

move a heavy patient, and (3) increased use of mechanical patient lifters.

The turnover of nursing home personnel is such that the training in proper lifting techniques must be provided on a continuous basis if it is to be effective. A review of the employers' reports covering the lost-time injuries to nurses' aides indicates that 55 percent had worked for their employers for less than six months at the time of injury.

Falls or slips, accounting for about 30 percent of the injuries, were the second most important type of accident. More than half of these occurred on wet or littered surfaces. Some of the injuries occurred on freshly mopped floors, some in bath and shower rooms as attendants bathed patients, and some occurred when workers slipped on unnoticed wet spots or objects on the floor. A few falls occurred as employees were carrying supplies, walking up or down stairs, or when they tripped while walking through doorways. The need for good housekeeping is obvious.

Wheelchairs, patient lifts, walkers, and food or laundry carts presented a special hazard because of their mobility. Hospital beds were involved in a number of injuries, several of these happening when employees struck against protruding bed cranks which had not been moved out of the way.

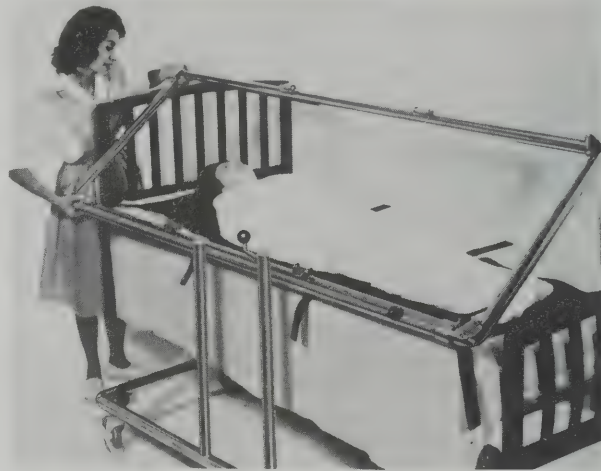
Cooks, dishwashers, and other kitchen workers were injured in a variety of ways. They were cut while using knives, can openers, or other sharp objects; they sustained burns while washing dishes, cooking, or preparing coffee or tea; and they were struck by falling cans or other supplies which were being stored, or by equipment which fell on them. Several workers developed contact dermatitis from using detergents, bleach, or other cleaning agents; impervious-type gloves might have prevented the dermatitis.

The foregoing indicates the need for a safety program in these establishments, regular and continued training along with specialized training aimed at specific problem areas.

The use of patient handling equipment, as pointed out, will help to minimize the greatest number of injuries currently being experienced. Photographs of some such equipment are shown for information. The pictures of the Surgilift and the Portable Patient Lift are courtesy of Mr. Robert Flood, representative of American Wheel Chair, a Division of Institutional Industries, Inc. The picture of the Portable Bath-Lift is courtesy of Mr. J. Bates McIndow, representative of American-Standard, Plumbing and Heating Division.



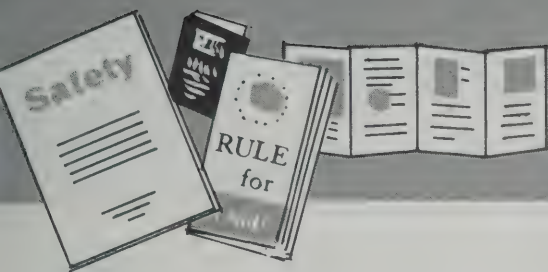
PORTABLE PATIENT LIFT



SURGILIFT
(One nurse can transfer a patient)



PORTABLE BATH-LIFT
(Hydraulically operated)



PUBLICATIONS AVAILABLE

BULLETINS

Bulletin S-103, "Safe Handling of LP Gas," gives the use and characteristics of LP gas and rules for safe handling.

Bulletin 104, "Ground It!" explains the need for grounding electrical hand tools.

Bulletin 106, "Ladders on the Farm," gives pointers to reduce the high rate of farm ladder injuries.

Bulletin 107, "The Ship-Shape Shop," shows the value of good house-keeping.

Bulletin 108, "Taming the Circular Saw," deals with a useful but dangerous tool.

Bulletin 110, "Tips for Hotel Workers," is a guide to safety in hotel work.

Bulletin 111, "Farm Safety Check List," is a safety guide for everyone on the farm.

Bulletin 117, "Stop Grinding Out Injuries!" describes abrasive wheel precautions.

Bulletin 120, "Safety Rules for Painters," shows how to prevent injuries to painters.

Bulletin 121, "Ladder Safety Step by Step," explains how to avoid ladder accidents.

Bulletin 122, "Handy Rules for Hand Tools," describes the proper care and use of many common tools.

Bulletin 125, "Are You Using Carbon Tet?" deals with a hazardous chemical.

Bulletin 127, "Look Out for Yourself When You Are Around Crop Spraying," is directed to the farm-workers. (*Available in Spanish also.*)

Bulletin 128, "If You Work in a Quarry," covers quarry and open-pit mine workers.

Bulletin 133, "Analysis of California Logging and Sawmill Fatalities," contains a study of logging and sawmill deaths in California.

Bulletin S-135, "Check List of Requirements," is a guide for employers, safety engineers, and purchasing agents to show what they should check for before buying or renting equipment or placing contracts.

Bulletin 137, "Skin Trouble Is Plenty Trouble," deals with the most common disease you can get at work.

Bulletin 140, "Keep AWAY From Power Lines!" is about the hazards of overhead electric power lines. (*Available in Spanish also.*)

Bulletin 141, "Power Hand Saw Safety," gives causes of power hand saw injuries.

Bulletin 142, "Read and Understand the Label!" reminds us of a vital need.

Bulletin 143, "Trade Association Safety Programs," reveals their value.

Bulletin 144, "The Know-How of Wire Rope Safety," gives valuable pointers.

Bulletin S-146, "Safety in Pipeline Construction," tells how to plan and organize pipeline jobs, and practices necessary to insure safety in various phases of the job.

Bulletin 147, "The Safe Use of Anhydrous Ammonia in Agriculture," discusses the three most important things which, if remembered, make anhydrous ammonia safe to use.

Bulletin 148, "The Safe Use of Aqua Ammonia in Agriculture," describes the precautions necessary for safe use of aqua ammonia.

Bulletin 150, "Electrical Safety and Swimming Pools," describes precautions to make swimming pools safe electrically.

Bulletin 151, "Control of Noise in Industry," describes methods for either eliminating or controlling excessive noise.

Bulletin 153, "Electrical Safety on the Farm," tells how to guard against electrical hazards.

Bulletin 154, "The Tailgate Safety Meeting," gives pointers on an effective means of promoting on-the-job safety.

Bulletin 155, "Pesticide Regulations," tells how to guard against hazards in the use of pesticides containing organic phosphates.

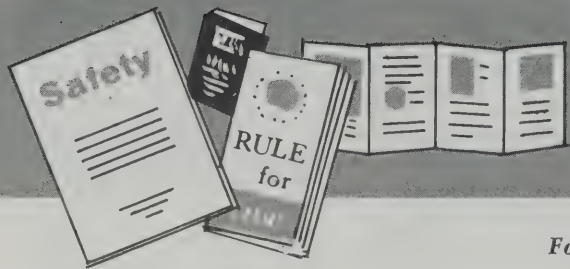
Bulletin S-156, "Guard Standards, No. 1, Materials and Construction," gives invaluable advice on constructing guards and selecting the right materials for them.

Bulletin S-157, "Guard Standards, No. 2, Stairways and Railings," gives requirements for stairways, railings, entrances to stairways, and floor and wall openings.

Bulletin 158, "Protection of Workmen in Trenches," describes measures to reduce the heavy death toll in excavations.

Bulletin S-415, "Your Life May Depend on a Safe Scaffold," gives requirements for a safe scaffold.

Form S-657, "Accident Prevention Program for the Construction Industry," contains requirements every construction employer must observe.



PUBLICATIONS AVAILABLE

PLACARDS

Form 101, "Safe Handling of LP Gas," gives safe procedures for handling and installing LP gas units. 5½" x 8½"

Form 611, "Construction Hoisting Signals," gives bell or whistle signals required by Construction Safety Order 1612(c). 5½" x 7"

Form 615, "Stop Machinery before Oiling, Cleaning, Repairing," 8½" x 11"

Form S-617, "Wear Goggles. You Can Get Used to Goggles—But Never to a Glass Eye," for posting in eye-hazardous areas. 8½" x 11"

SAFETY ORDERS

The following safety orders are available from Documents Section, P.O. Box 20191, Sacramento 95820.

Where safety orders have been revised (as almost all of them have been), the date is the date of the latest revision.

Money orders or checks made payable to the Documents Section must accompany all purchase orders. Don't send stamps.

Documents Section gives a 10 percent discount on purchases of 50 or more copies of any one title.

Don't forget to add 5 percent sales tax if you live in California.

	Price	With Sales Tax
Aerial Passenger Tramway Safety Orders (1956)	\$0.75	\$0.79
Boiler and Fired Pressure Vessel Safety Orders (1966)75	.79
Compressed Air Safety Orders (1966)75	.79
Construction Safety Orders (1965)	2.00	2.10
Electrical Safety Orders (1962)	2.00	2.10
Elevator Safety Orders (1954)	1.50	1.58
General Industry Safety Orders (1963)	1.50	1.58
Logging and Sawmill Safety Orders (1958)	1.50	1.58
Mine Safety Orders (1958)	1.00	1.05
Petroleum Safety Orders—Drilling and Production (1959)	1.50	1.58
Petroleum Safety Orders—Refining, Transportation and Handling (1951)	1.00	1.05
Pneumatic Explosives Loading Safety Orders (1944), Quarry and Open Pit Mine Safety Orders (1953)	1.00	1.05
Ship and Boat Building Safety Orders (1961)75	.79
Tunnel Safety Orders (1962)	1.00	1.05
Unfired Pressure Vessel Safety Orders (1964)	1.00	1.05
Window Cleaning Safety Orders (1952)75	.79
Chapter 4 of Title 8, including all Safety Orders	16.00	16.80

Should you desire to reprint any of our safety publications, you may do so. Please write a credit line—Division of Industrial Safety, State of California—and send us one copy of reprint.

Form 620, "All equipment shall be so positioned, equipped, or protected so that no part shall be capable of coming within 6 feet of high-voltage lines." Notice required by Construction Safety Order 1768(c). 8½" x 11"

Form 627, "Caution! Don't Go Between Brow Log and Load. Don't Dump Logs Until All Men Are Clear." For use at log dumps and ponds. 8½" x 11"

Form 634, "Responsibilities Prescribed in California Labor Code," lists them for employer and employee in matters of safety. 8½" x 11"

Form 669, "Unlawful to Operate This Equipment Within 6 Feet of High-Voltage Lines." Notice required by Electrical Safety Order 2603(c), Construction Safety Order 1768(c) and California Penal Code Sec. 385. 8½" x 11"

Form S-800, "Hand Signals for Boom Equipment Operation," shows approved arm and hand signals in pictures. 8½" x 11"

STICKERS

Form 616, "Warning—This machine is automatically controlled and may start at any time." 3" x 5¼"

Form S-658, "Remember! This guard is here for your protection!" 3" x 5¼"

REPRINTS

Division Safety Order Can Apply to Protect the General Public...

GISC Aim, Scope, Organization, and Policies

How California's Safety Orders for Industry are Developed

Lifting With Safety

Low-Voltage Temporary Power and Lighting Installations

Power Press Safety

Transportation of Workers—Current California Regulations

The bulletins, placards, and stickers are available to those interested in accident prevention. Requests for material should be sent to Division of Industrial Safety, Educational Section, 455 Golden Gate Avenue, San Francisco, California 94102, or to Division of Industrial Safety, Educational Section 3460 Wilshire Blvd., Los Angeles, California 90005.

If you require 500 or more copies you may obtain price quotations directly by writing to: Documents Section, P.O. Box 20191, Sacramento, California 95820. Then place your order with them.



NORMAN D. HURLHEY HONORED

The Joseph A. Holmes Association Certificate of Honor was awarded Mr. Hurlhey for supervising a crew of 31 men who have worked in a surface quarry since December 7, 1950, to December 7, 1966, and continuing (over a million man-hours) without a disabling injury.

Pictured from left to right are: Donald A. Bussey, plant superintendent, Moss Landing Area Plants, Kaiser Refractories; Jack F. Hatton, Chief of the Division of Industrial Safety, Department of Industrial Relations; Norman D. Hurlhey, quarry supervisor of the Natividad Plant, Kaiser Refractories; Larry Stewart, director of labor relations, Kaiser Aluminum & Chemical Corporation, and J. Ivan Hall, plant superintendent, Natividad.

Larry Stewart made the presentation at a dinner meeting of the Governor's Industrial Safety Conference Regional Construction Committee at Del Rey Oaks on September 7, 1967. Mr. Hatton was the principal speaker for the meeting.

The Joseph A. Holmes Safety Association was founded in 1916 by 24 leading national organizations representing the mining, metallurgical, and allied industries to commemorate the efforts of Dr. Joseph Austin Holmes, the first Director of the Bureau of Mines, to reduce accidents and ill health in the mining and allied industries and to promote the doctrines of safety and conservation of life in those industries. It is the aim of the association to bring safety before the public and to stimulate the safety movement by giving suitable annual awards for outstanding achievements and for personal heroism or distinguished service in the saving of life in any branch of the mining, quarrying, and mineral extractive industries.



REGIONAL MEETINGS

Regional meetings of the various sections of the Governor's Industrial Safety Conference are held from time to time throughout the year.

Shown above from left to right are: Harry A. Guthrie, safety engineer (construction), Division of Industrial Safety; Robert M. Evenden, manager of personnel administration, Guy F. Atkinson Construction Company; Jack F. Hatton, Chief of the Division of Industrial Safety; and Thomas Batterton, safety engineer (industrial), Division of Industrial Safety. Guthrie and Batterton helped organize the Construction and Industrial Industries Regional Meeting held at Eureka on November 2, 1967. Evenden's subject was "Industrial Accident Prevention: Defined in Focus and Integrated." Hatton discussed the state's roll in accident prevention. More than 100 were in attendance.

At San Jose, on October 18, 1967, Hatton addressed a regional meeting for working supervisors; he stressed education and training for safety.

At the Santa Cruz-Monterey regional meeting on October 5, 1967, Ralph Mudge, business representative, Construction and General Laborers' Union Local 283, Santa Cruz, said, "To me, the most encouraging segment of the endeavor is the manner in which management, labor, and the Division of Industrial Safety have worked harmoniously for the common good."

The interest in these and other regional meetings forecasts a record attendance at the Governor's Industrial Safety Conference next February.

Offices of the Division of Industrial Safety

The following is a list of main and field offices of the DIS.

MAIN OFFICES

SAN FRANCISCO.....455 Golden Gate Ave. 94102 415-557-1946
Los Angeles.....3460 Wilshire Blvd. 90005 213-381-5695

OTHER OFFICES

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CALIFORNIA SAFETY NEWS

Vol. 51, No. 3

July 1967



Falling a giant redwood



Jack F. Hatton, Chief, Division of Industrial Safety, presents Nat Edwards Memorial Plaque to Foster Morrison of Diamond National Corporation.

The Division Salutes the Wood Industry

The wood industry has made great strides in safety. This issue of the *California Safety News* presents an article detailing the safety efforts of the logging and sawmill industry, and appreciation is expressed of their accomplishment.

Working with timber and wood products is a most demanding occupation that permits few mistakes. Modern sawmills and woodworking equipment have replaced the older machines, with a definite influence on safety, but in the woods there is still danger from falling trees and limbs and rolling logs. The industry is aware of this and is making a tremendous

effort to reduce injuries and deaths in lumbering and in sawmills.

The industry's injury rate has been reduced from 137 per thousand in 1952 to 96.3 per thousand in 1966. It has reduced fatalities from 90 in 1952 to 23 in 1966. In strictly lumbering, the fatalities fell from 65 to 14 in this same period of time. This is a commendable accomplishment.

The Division of Industrial Safety has worked closely with logging and sawmill employers, but the significant factor is that the industry itself is carrying on a noteworthy overall safety program.

Log loading at landing



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Albert C. Beeson, Director of Department
Jack F. Hatton, Chief of Division

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The California Safety News is mailed free of charge to those interested in industrial safety.

If You Move—

If you move, and wish to continue receiving the CSN, please notify us of your new address.

In the April issue of the *California Safety News* you received a card asking if you wanted to remain on the mailing list. If you do, it is important that you post it immediately, if you have not already done so.

The *California Safety News* is interested in obtaining usable safety information. If you have a unique idea for safety, or your plant has made a safety record or established a safety procedure that you think might interest others, please send it in. The *California Safety News* does not pay for material, but may give it worldwide distribution.

Cover pictures courtesy Pacific Lumber Company

COMMON SENSE IN FORK TRUCK OPERATION

During the past few years, the fork truck has become an indispensable part of the industrial process. They are being used in factories and warehouses, in the fields, and on the waterfront. They load logs in the woods and ships at the docks, handling everything from machines to baby bottles.

Forklift trucks are operated with various types of powerplants, using gasoline, diesel fuel, liquefied petroleum gas, and electricity from storage batteries for motive power. For work in the open air and on heavy, rough jobs, gasoline, LPG, or diesel engines provide great power and fast travel and elevating speeds. The battery-operated trucks are economical, operate quietly, and do not emit exhaust gases. These trucks are particularly suited for use indoors and in confined spaces. LPG powered trucks are economical and require less maintenance because the fuel has almost complete combustion and less carbon monoxide is generated than from gasoline-operated trucks. Diesel-powered lift trucks have the advantage of a safer fuel than gasoline and are more economical to operate; also carbon monoxide is greatly reduced in a diesel motor exhaust, but harmful oxides of nitrogen are present. Diesel engines have been found safer in those areas where it is necessary to operate a lift truck in the presence of combustible materials that have a low flashpoint.

When properly maintained and operated, the fork truck is a husky, versatile piece of equipment. However, every year we investigate many injuries and deaths involving fork trucks. These investigations reveal that in most cases the cause of the accident was inadequate maintenance or improper operating technique, or a combination of both.

What can an employer do to reduce accidents that occur with his forklift trucks?



Forklift truck handles mammoth load

What the Rules Say

California General Industry Safety Orders clearly define the laws governing fork truck operation and establish operating rules in Section 3408. Operating rules:

(a) Every employer shall promulgate, post, and enforce a set of operating rules or use the rules listed below.

(b) (1) Only drivers authorized by the employer and trained in the safe operation of industrial trucks shall be permitted to operate such vehicles.

(2) Drivers shall not operate trucks other than those for which they are authorized. Trainees may be authorized to operate trucks provided they are under competent supervision.

(3) Before operating any truck, drivers shall check the vehicle, and if it is found to be in any way unsafe, the matter shall be reported immediately to a foreman or mechanic, and the vehicle shall not be put in service again until it has been made safe.

(4) Special consideration shall be given to the proper functioning of tires, horn, lights, battery, controller,

lift system (including forks, chains, cable, and limit switches), brakes, and steering mechanism.

(5) Trucks shall be operated at an authorized safe speed, but consistent with conditions, always maintaining a safe distance from other vehicles and keeping the truck under positive control at all times.

(6) No riders shall be permitted on industrial trucks unless provided with adequate riding facilities.

(7) Employees shall not ride on the forks of lift trucks.

(8) Stunt driving and horseplay are prohibited.

(9) Loaded trucks shall not be moved until the load is safe and secure.

(10) The forks shall always be carried as low as possible, consistent with safe operation.

(11) When leaving an industrial truck unattended, the power shall be shut off, brakes set, key or pull connection plug removed, and forks left in the down position.

(12) When left on an incline, the wheels shall be blocked.

(13) Extreme care shall be used when tilting loads.

(14) Operators shall face in the direction of travel whenever possible and shall not move a truck until certain that all persons are in the clear.

(15) Vehicles shall not be run onto any elevator unless specifically authorized to do so. Before entering an elevator, drivers shall make sure that the capacity of the elevator is not exceeded. Once on an elevator, they shall shut off the power and set the brakes.

Other Guarding

In addition to the operating rules governing fork trucks, the State of California also requires that whenever a lift truck operation exposes a driver to danger from falling objects the truck must be equipped with an overhead guard, and the guard must be of sufficient strength to support loads in accordance with the specifications set out in the General Industry Safety Orders of the State of California. In addition, every high-lift truck handling small objects or unstable loads must have a vertical backrest or guard at the rear of the load platform which shall be at least high enough to reach above the center of the top tier of the maximum-height-load handled and shall have no opening greater than the smallest object carried.

These are minimum standards that apply statewide, but the question is, how can you prevent forklift accidents in your particular plant?

Training Program

Let's start with the operator. He should be experienced, responsible, stable, and in good health.

The best way to obtain these provisions is to set up a training program.

Any major forklift manufacturer will assist you in setting up a training program. Most of them will provide instruction manuals and visual aid material. They will provide sample examinations on safe driving and on preventive maintenance. They will even show you how to lay out a driver training concourse, and they will offer advice on material handling.

Be sure you select able, conscientious trainers. Just because a man is a good leaderman does not mean he is a

good trainer. There were many red faces in a large pipe manufacturing operation when their trainer of forklift operators, a leaderman, got out of the seat of his lift truck, left the motor running and forgot to set the emergency brake. He walked in front of the truck, which started forward when the magnetic clutch engaged. It pinned him against a post, breaking his ankle and leg.

The candidates for the forklift drivers' training course should be in good physical condition.

The ASME Code recommends that industrial truckdrivers be examined by a physician and also that visual acuity be thoroughly checked. Hearing loss can be adjusted by use of a hearing aid, but the operator should be able to hear ordinary conversation—with the aid, if necessary. Physical deficiencies can be tolerated, provided they do not impair driving skill.

Additionally, all drivers should be required to have periodic checkups by a physician.

Use of the standards and testing devices of the American Automobile Association are a great help in the selection of industrial truckdrivers. These include visual acuity, hearing, strength of grip, activity, steadiness, and foot reaction.

Now that you have trained, healthy drivers, they must be backed with good drivable equipment, adequately maintained.

Keep 'em Running

A suggested maintenance program on a weekly checkup schedule should include:

Lubrication, cleaning of the air cleaner, testing of brakes, checking of batteries (on battery-operated rigs), checking of oil level in the hydraulic system, and a visual check of pump and valves for leaking.

The lifting mechanism *should be lubricated*. Examine the forks for distortion, twisting, or bending.

Check the radiator.

You might even wash and clean the forklift truck.

Every month your mechanic should check over the motor and the lift and tilt mechanism, examine the steering

connections, and check wheel alignment.

The six-month and yearly inspections should include hydraulic system drainage and refill and the same with the transmission and differential gearboxes. Brakes should be cleaned, and if necessary, relined. All wheel bearings, along with spur and ring gears on drive wheels, should be cleaned and repacked.

Safe Work Areas

Trained, healthy drivers and a good preventive maintenance program are most important, but don't neglect good housekeeping and safe work areas.

All roadways and warehouse flooring should be in good condition, as level as possible, no ruts, chuckholes, or uneven spots. All up and down ramps should be as smooth as you can get them. Make sure all dock plates are securely fastened to prevent movement when the forklift truck passes over them, and of course strong enough to safely support the loads they must carry.

In the plant or warehouse, traffic lines should be painted and maintained. Take special care to plainly mark pedestrian crossings and, if necessary, install stop signs.

There should be a special area for refueling, provided with plenty of ventilation. Motors must be shut off before refueling and only authorized personnel should do the refueling.

The forks used on the high-lift trucks should have at least a 3-to-1 factor of safety, as recommended by the American Standards Association. In addition, all forks in use must be located in place to prevent shifting and thereby dropping the load.

If personnel is to be elevated on the forks, a personnel pallet with standard guard railings must be used. The pallet must have substantial securing device to hold it firmly on the forks. Recently a janitor was killed when the device securing the pallet to the forks failed and he fell to his death.

The most important things to keep in mind in forklift safety are training, maintenance, supervision, and common sense.

Fork Lift Drivers Should Use Seat Belts

There are enough examples of injuries and fatal accidents to forklift drivers to suggest strongly that they should wear seat belts.

An employee of a machinery manufacturing company was driving a forklift truck. It was struck by another truck and overturned. The forklift driver was thrown out and crushed by the canopy.

Another manufacturing firm's forklift truckdriver lost his life when he drove too fast around a corner. The forklift turned over, throwing him out of and under the tipping vehicle.

Though untrained in forklift operation, an employee of a sugar company "borrowed" a forklift truck to go from one building to another. He hit a low obstruction and the vehicle overturned. He, too, was crushed to death.

A livestock feed company's man was driving a forklift truck with a faulty governor. He took a turn too fast, turned over, and was crushed under the vehicle after he'd been catapulted from the driver's seat.

What He Forgot

He brushed his teeth twice a day.

The doctor examined him twice a year.

He wore his rubbers when it rained.

He slept with the windows open at least eight hours every night.

He stuck to a diet with plenty of fresh vegetables.

He relinquished his tonsils and traded in several wornout glands.

He never smoked, drank or lost his temper.

He did his daily dozen daily, besides taking plenty of outdoor exercise.

He was all set to live to be 100.

The funeral will be held next Wednesday.

He is survived by 18 specialists, four health institutes, six gymnasiums, and numerous manufacturers of health foods and antiseptics.

He had forgotten about trains at grade crossings.



Polypropylene Safety Net Guards Steel Men on Five Month Project

Picture courtesy Pedly Knowles & Co.

Larry Espinosa, project manager of Kaiser Steel, reported no falls or injuries during the five-month use of the net while the San Mateo Creek Bridge was being erected at Crystal Springs.

The bridge net came in sections of 60' x 80'. Sixteen sections were used on the job. A test net 17' x 24' will support 1,050 pounds dropped 30 feet; a larger net supports still greater weight, proportionate to size.

Moused safety hooks were used to tie the one-inch border rope to the 360-foot span cable. The net itself was six-inch-mesh, diamond-shape design, placed eight feet below the work area. The men who erected the net were secured to the span cable with safety belts and lifelines.

Rope for the net was 5/16-inch polypropylene, three-strand soft lay. The synthetic material was chosen for its exceptional resistance to moisture, mildew, fungus growth and ultra-violet light rays. To combat the UV rays, its color was black.

Polypropylene rope weighs 1.9 pounds per 100 lineal feet or 0.11 pound per square foot of net—its lightness being an advantage in handling.

While there is no specific safety factor required by the California Construction Safety Orders, Section 1672(c) requires that nets conform to the manufacturer's recommendation for resisting the impact that might be expected at the site.

The orders require a safety net for men working 25 feet or higher from the ground. Nets must be placed not more than 10 feet vertically below where falling hazards exist and they must extend at least eight feet horizontally beyond the perimeter of a structure they serve.

The net on the Kaiser job satisfied all requirements. The material and design were good and the plastic binding at rope crossings was effective. The men who installed the nets were protected by approved safety belts adequately tied off.



THOMAS H. BATTERTON, Safety Engineer,
Industrial Section, Division of Industrial Safety

In the early history of accident prevention the emphasis was on mechanical guarding, and this was assumed to be the responsibility of each individual employer.

As the safety movement matured and expanded, various companies combined their safety knowledge and experience in industry-wide associations.

In 1923 a group of farsighted lumbermen, led by D. S. Painter of Fruit Growers Supply Company, met with a state body now known as the Division of Industrial Safety, and formed the Lumbermen's Accident Prevention Association.

In 1939 at the fifth annual Western Safety Conference, held in Oakland, a number of lumbermen broke away from the Lumbermen's Accident Prevention Association to form an independent organization representing the lumber industry. They formed a non-profit corporation in 1944, known by its present name, California Lumbermen's Accident Prevention Association, with D. N. (Nat) Edwards as secretary-treasurer.

The aim and purpose of this new organization was to create greater awareness of the value of injury prevention, pump new vitality into safety programs, develop new techniques to improve attitudes and skills in injury prevention throughout the industry, and to collect and disseminate information concerning the number, types and causes of injuries.

California Lumbermen Unite to Eliminate Work Injuries

In addition, the new group would cooperate with all government agencies and with other accident prevention organizations.

Most of the major lumber companies in the state are today members of this organization.

The membership includes companies that are engaged in timber management and harvesting, lumber manufacturing and remanufacturing, transportation of lumber products, and sales and distribution to the consumer.

Testifying to the effectiveness of this organization are the statistics that show that over the past 20 years the accident frequency of member companies has been reduced over 53 percent.

Such pioneers and leaders in accident prevention as Walter Collins of Union Lumber Company and Hammond Lumber Company (now Georgia Pacific) and Derby Bendorf of the Pacific Lumber Company, have actively participated in C.L.A.P.A.

Many of the best known safety men in the industry have been prominently active in the C.L.A.P.A. organization.

The Association is divided geographically into four districts: Mount Shasta, Mother Lode, C. R. Johnson (the Redwood Region), and Mount Whitney.

Since its inception, meetings have been held in various parts of the state. Here, members compare their accident experiences, discuss accident causes, and prescribe cures.

The association acts as a clearing house for disseminating information on accident prevention and it publicizes new ideas and methods for reducing work injuries.

The C.L.A.P.A. helps formulate a manual of safe working practices and procedures, available to members for distribution to their employees.

The members have active accident prevention programs stressing employee participation.

The association cooperates with the Division of Industrial Safety and takes an active part in amending and rewriting the safety orders that affect the lumber industry.

It has designed and adopted standard reporting forms for use in compiling accident statistics by the member firms. These forms provide a breakdown of accidents according to causes and provide for obtaining other information needed for an accurate analysis of accidents in the forest products industry.

This information from individual members is compiled, and from it the association prepares an analysis of injury causes in the industry on a state-wide basis. (See page 7.)

Dangerous physical exposure points up logging hazards



All members report their accident frequencies and these are tabulated. (See pages 8-9.) The Johnson Index shown for each company is somewhat higher than the standard accident frequency rate because this index is used to give some significance to the severity of accidents. In arriving at the index figure one point of frequency is charged for each 1,000 days chargeable to severity. The number of chargeable days for each accident is governed by Z-16.1 of the American Standard Association.

Recently an outstanding safety record has been set by the members of C.L.A.P.A. Employees of the companies represented worked over 28,427,000 man-hours during 1966, with a total of 810 disabling injuries, for an overall frequency for all members of 28.49—compared with an average lumber industry frequency of 46.5.

Each year awards are presented at the annual banquet for the best accident frequencies accomplished by member companies.

The Nat Edwards Memorial plaque is presented to the company with over 300,000 man-hours of exposure, having the lowest Johnson Index. The Derby Bendorf Memorial plaque goes to the company working less than 300,000 man-hours, with the lowest Johnson Index.

The recipients of these awards for 1966, as well as the district award winners, and for best records in separate fields were:

	Johnson Index
Nat Edwards Memorial, Diamond National Corporation.....	3.999
Derby Bendorf Memorial, Shasta Forests Company.....	.000
<i>District Awards</i>	
Mount Shasta, Shasta Forest Company.....	.000
Mother Lode, Stockton Box Company.....	10.336
C. R. Johnson, Arcata Redwood Company.....	15.573
Mount Whitney, General Box Distributors.....	18.936
<i>Separate Fields</i>	
Logging Award, Georgia Pacific Corporation (Feather Falls).....	.000
Manufacturing Award, Cal-Pacific Redwood Company.....	.000
Plywood & Veneer Award, United States Plywood Corp. (Redding).....	4.579

In the logging category five additional companies had no disabling injuries.

The future of C.L.A.P.A. looks bright! The sum total of human misery eliminated by the reduction of accidents implicit in the members' frequencies justifies their efforts and should attract new members.



Loading logs aboard ship

Sources of Injuries in the Logging and Lumber Industry

Compiled from Experience of Member Companies of the
CALIFORNIA LUMBERMEN'S ACCIDENT PREVENTION ASSOCIATION
Overall Composite—Year of 1966

Sources of injuries	Overall total accidents	Percentage of overall total
1 Struck by, striking against.....	244	30.13
2 Caught in or between.....	88	10.86
3 Falls.....	162	20.00
4 Strain or over-exertion.....	215	26.55
5 Moving motor vehicle accidents.....	13	1.60
6 Contact with temperature extreme.....	11	1.35
7 Inhalation, absorption, swallowing.....	12	1.48
8 Foreign bodies in eyes.....	16	1.98
9 Slivers.....	25	3.09
10 Injury type N.E.C.....	24	2.96
Total.....	810	100.00%

Injury type		
1 Laceration, puncture, wound.....	104	12.84
2 Contusion, abrasion.....	217	26.79
3 Strain, sprain, dislocation.....	281	34.69
4 Infection.....	19	2.35
5 Burn, scald, flash.....	18	2.22
6 Fracture.....	100	12.35
7 Fatalities.....	7	.86
8 Permanent partial disability.....	38	4.69
9 Injury type N.E.C.....	26	3.21
Total.....	810	100.00%

INDUSTRIAL ACCIDENT

OF MEMB

CALIFORNIA LUMBERMEN'S ACC

JANUARY 1 1966

NAME OF COMPANY	Logging						Manufacture						Ve	
	MAN HOURS	DISABLING INJURIES	DAYS CHARGED	FREQUENCY	N. OF EMPLOYEES	JOHNSON INDEX	MAN HOURS	DISABLING INJURIES	DAYS CHARGED	FREQUENCY	N. OF EMPLOYEES	FATALITIES		JOHNSON INDEX
AMERICAN FOREST PRODUCTS CORP. DORRIS	46,428	3	137	64.616	44	0	64.753	173,320	3	26	17.309	101	0	17.3
AMERICAN FOREST PRODUCTS CORP. MARTELL	198,738	3	239	15.095	105	0	15.334	687,170	35	1,052	50.934	350	0	51.9
AMERICAN FOREST PRODUCTS CORP. NORTH FORK	118,868	4	41	33.651	73	0	33.692	227,839	10	488	43.891	103	0	44.
ARCATA REDWOOD CO. ARCATA	75,027	5	160	66.643	40	0	66.803	511,841	4	77	7.815	245	0	7.8
CAL-PACIFIC REDWOOD CO. ARCATA	54,187	5	102	92.273	29	0	92.375	174,462	0	0	.000	95	0	.00
COLLINS PINE CO. CHESTER	190,161	5	114	26.294	121	0	26.408	559,586	18	698	32.167	285	1	39.
CRANE MILLS CORNING	91,278	1	139	10.956	48	0	11.095	216,996	4	152	18.434	104	0	18.
DIAMOND NATIONAL CORP. RED BLUFF								809,251	2	1528	2.471	370	0	3.9
FRUIT GROWERS SUPPLY CO. HILT	165,078	7	137	42.404	115	0	42.541	297,465	16	473	53.788	142	0	54.
GENERAL BOX DISTRIBUTORS FRESNO	51,684	0	0	.000	41	0	.000	814,400	13	3,226	15.963	551	0	192
GEORGIA PACIFIC CORP. FEATHER FALLS	92,029	0	0	.000	63	0	.000	347,832	23	357	66.124	135	0	66.
GEORGIA PACIFIC CORP. SAMOA	295,150	17	7,197	57.598	173	1	64.795	1,271,728	23	1,254	18.086	645	0	19.
HUGHES BROTHERS FORESTHILL	22,607	7	305	309.639	17	0	309.944	133,098	6	55	45.079	74	0	45.
INTERNATIONAL PAPER CO. WEED	172,278	17	477	98.678	93	0	99.155	735,551	22	1,106	29.910	343	0	31.0
LEV LUMBER CO. OAKHURST								101,585	3	14	29.532	86	0	29.
LINEBAUGH S.C. LOGGING CO. WHITE PINES	132,828	7	48	52.700	80	0	52.748							
LORENZ LUMBER CO. BURNEY	99,287	5	195	50.359	60	0	50.554	267,605	17	202	63.526	230	0	63.
MICHIGAN CALIF. LUMBER CO. CAMINO	9,804	1	6,000	101.999	6	0	107.999	450,615	23	788	51.041	215	0	58.
MT. WHITNEY LUMBER CO. JOHNSONDALE	40,823	3	21	73.488	21	0	73.509	223,233	11	59	49.276	116	0	49
NORBY LUMBER CO. NORTH FORK	21,477	1	154	46.561	21	0	46.715							
PACIFIC LUMBER CO. THE SCOTIA	245,361	12	311	48.908	118	0	49.219	1,644,933	46	9,124	27.965	807	1	37.
PICKERING LUMBER CORP. STANDARD	36,630	2	14	54.600	12	0	54.614	852,654	53	6,465	62.159	388	1	68
PINE LOGGING CO. OF CALIF. FRESNO	45,243	4	73	88.411	30	0	88.484	44,557	2	14	44.886	34	0	44
SCOTT LUMBER CO. INC. BURNEY	40,529	2	218	49.347	42	0	49.565	340,348	9	367	26.444	167	0	26.
SEQUOIA FOREST INDUSTRIES INC. DINUBA	31,573	1	6	31.673	22	0	31.679	424,868	27	649	63.549	195	0	64.
SHASTA FORESTS CO. REDDING	46,541	0	0	.000	39	0	.000							
SIMPSON TIMBER CO. ARCATA	692,570	23	10,409	33.210	365	1	43.619	1,283,418	20	911	15.583	700	0	16.
STOCKTON BOX CO. STOCKTON	147,539	9	305	61.001	70	0	61.306	1,161,864	4	103	3.443	534	0	3.
TRINITY ALPS LUMBER CO. HAYFORK	1,902	0	0	.000	1	0	.000	210,822	11	87	52.177	136	0	52.
TWIN PARKS LUMBER ARCATA	6,080	0	0	.000	8	0	.000	100,480	5	84	49.671	55	0	49.
UNION LUMBER CO. FORT BRAGG	323,830	14	6,789	43.233	194	1	50.022	1,761,659	36	3,791	20.435	799	0	24
UNITED STATES PLYWOOD CORP. MC CLOUD	167,602	5	95	29.833	162	0	29.928	1,067,646	17	592	15.923	510	0	16.
UNITED STATES PLYWOOD REDDING	27,022	0	0	.000	7	0	.000	650,795	11	670	16.902	258	0	17.
WETSEL-OVIATT LBR. CO. INC. OMO RANCH	111,660	8	65	71.646	53	0	71.711	248,952	20	617	80.337	122	0	80
WILLITS REDWOOD PRODUCTS CO. WILLITS	43,643	2	197	45.826	24	0	46.023	322,718	8	141	24.789	163	0	24
YANCEY E.B. LUMBER CO. TOLLHOUSE	38,010	1	1	26.309	20	0	26.310	32,454	2	3	61.626	14	0	61.
TOTAL	3,883,467	174	33,949	44,805	2,317	3		18,151,745	504	49,228	27.766	9,072	3	

Compiled by California Lumbermen's Accident Prevention Association

EXPERIENCE COMPOSITE

COMPANIES

ACCIDENT PREVENTION ASSOCIATION

DECEMBER 31 1966

Lumber & Plywood							Miscellaneous							Total Operation							
MAN HOURS	DISABLING INJURIES	DAYS CHARGED	FREQUENCY	No. OF EMPLOYEES	FATALITIES	JOHNSON INDEX	MAN HOURS	DISABLING INJURIES	DAYS CHARGED	FREQUENCY	No. OF EMPLOYEES	FATALITIES	JOHNSON INDEX	MAN HOURS	DISABLING INJURIES	DAYS CHARGED	FREQUENCY	No. OF EMPLOYEES	FATALITIES	JOHNSON INDEX	
															219,748	6	163	27.304	145	0	27.467
379,092	13	216	34.292	180	0	34.508									1,265,000	51	1507	40.316	635	0	41.823
															346,707	14	529	40.380	176	0	40.909
															586,868	9	237	15.336	285	0	15.573
															228,649	5	102	21.868	124	0	21.970
							152,674	2	85	13.100	78	0	13.185		902,421	25	7162	27.703	484	1	34.865
															308,274	5	291	16.219	152	0	16.510
															809,251	2	1,528	2.471	370	0	3.999
															462,543	23	610	4.9725	257	0	50.335
															866,084	13	3,926	15.010	592	0	18.936
															439,861	23	357	52.289	198	0	52.646
831,438	20	353	24.051	372	0	24.408	709,927	12	280	16.903	306	0	17.183	3,108,243	72	2,084	23.164	1,496	1	32.248	
															155,705	13	360	83.491	91	0	83.851
498,721	7	119	14.036	253	0	14.155									1,406,550	46	1,702	32.704	689	0	34.406
															101,585	3	14	29.532	86	0	29.546
															132,828	7	48	52.700	80	0	52.748
265,762	18	517	67.730	114	0	68.247									632,654	40	914	63.226	404	0	64.140
							92,298	4	132	43.338	49	0	43.470	552,717	28	14,010	50.659	270	0	64.669	
															264,056	14	80	53.019	137	0	53.099
															21,477	1	154	46.561	21	0	46.715
261,953	9	6,310	34.357	118	1	40.667									2,152,247	67	15,745	31.130	1,043	2	46.875
306,634	15	444	48.918	131	0	49.362	10,857	0	0	.000	4	0	.000	1,206,775	70	6,923	58.006	535	1	64.929	
															89,800	6	87	66.815	64	0	66.902
							11,417	3	52	26.277	7	0	26.329	392,294	14	637	35.688	216	0	36.325	
							29,952	1	2	33.387	17	0	33.389	486,393	29	657	59.623	234	0	60.280	
															46,541	0	0	.000	39	0	.000
1283,846	17	2,735	13.241	677	0	15.976									3,259,834	60	14,055	18.406	1,742	1	32.461
															1,309,403	13	408	9.928	604	0	10.336
															212,724	11	87	51.710	137	0	51.797
															106,560	5	84	46.922	63	0	47.006
56,877	3	88	52.745	29	0	52.833	171,076	0	0	.000	83	0	.000	2,313,442	53	10,668	22.910	1,105	1	33.578	
															1,235,248	22	687	17.810	672	0	18.497
633,911	2	1,424	3.155	276	0	4.579	664,147	6	1,714	9.034	283	0	10.748	1,975,875	19	3,808	9.616	824	0	13.424	
															360,612	28	682	77.646	175	0	78.328
															366,361	10	338	27.295	187	0	27.633
							31,206	0	0	.000	18	0	.000	101,670	3	4	29.507	52	0	29.511	
4,518,234	104	12,206	23.018	2,150	1		1,873,554	28	2,265	14.945	845				28,427,000	810	97,648	28.494	14,384	7	

Ether Storage Can Generate Explosions

A recent occurrence at Chico State College emphasizes the need for special procedures and precautions in the handling and storage of ether compounds. An assistant professor of chemistry at the college, making a routine check of the contents of a storeroom, noticed a partially full five-gallon can of isopropyl ether and recalled reading recently about potentially dangerous properties of certain ethers. The article he remembered had stressed the property of many ether compounds to form peroxides under certain conditions of storage or use, and that these peroxides were potentially very powerful explosives which could be initiated by heat or shock.

The authorities were alerted and a special army detonation squad was called in to assist in disposal of the suspect container. After appropriate precaution, the container was removed to an isolated location and exploded with a detonating substance. The resulting explosion, far greater than could be attributed to the initiating charge itself, was violent enough to rattle windows almost a mile away and was heard over three miles away.

Ether Explosions

Other recently reported incidents illustrate the potential hazard of ether peroxides. At the University of Maine, two glass bottles of slightly less than one-gallon capacity, labeled "isopropyl ether," were found in a basement storeroom and apparently had been there for more than 20 years. Both bottles were nearly one-third full of a crystalline solid under the liquid upper layer. Aware of the peroxide hazard, the school authorities removed the bottles to a dump at the edge of town and then threw stones at the bottles to break them. The report goes on to state, "When the first stone struck, there was a violent explosion which blasted mud and debris over the surrounding landscape." Unfortunately, not all the incidents have had happy endings. A chemist was attempting to loosen the stuck glass cap on a pint

bottle of isopropyl ether and just as the cap broke loose the bottle exploded violently and the man died from the injuries received.

There are a great many different ether compounds, all being grouped in the same chemical "family" because of similarity in chemical structure and behavior. Other common families are the alcohols, acids, esters, etc. The best known and most commonly used ether is ethyl ether, also known as diethyl ether and sometimes as sulfuric ether. This compound finds frequent use as an industrial and laboratory solvent, and also is the ether most commonly used as an anesthetic. Another anesthetic ether is divinyl ether. Isopropyl ether has been advocated as a safer variety for many laboratory uses, because it is considerably less volatile than ethyl ether. Anhydrous or absolute ether is ethyl ether with all traces of impurities and water removed, making it chemically pure. There are many, many other ether compounds but these are the most common ones.

Peroxide Formation

At the present time, little is known about the mechanism which causes the spontaneous formation of peroxides in various ethers, nor is the exact chemical nature of these peroxides known. There appears to be ample evidence however that all the ethers mentioned above are subject to this hazardous property. Experience has indicated that while the formation of peroxides can occur under any condition, the reaction apparently is accelerated by exposure to light, and oxygen from the air. Contact with certain metals, particularly iron and copper, appears to inhibit peroxide formation but there is no evidence available yet to prove that the formation of peroxides can be entirely prevented.

The following facts regarding formation of peroxides seem to be established:

1. Exposure to the air, as in opened and partially emptied containers, accelerates formation of peroxides.
2. Exposure to light, as would occur in the case of storage in clear glass bottles, encourages formation.
3. Absolute ether undergoes oxidation (formation of peroxides) much more readily than ethyl ether containing a few tenths of a percent of water.
4. Isopropyl ether may be more vulnerable than other commonly used ethers to peroxide formation on long storage.
5. Heat encourages the inception of oxidation.
6. Distillation of ether containing peroxides greatly aggravates the potential hazard since the portion remaining in the heated distilling flask becomes more and more concentrated as the operation proceeds, in addition to the possibility of accelerated oxidation due to heat.
7. Some but not necessarily all ether peroxides are crystalline solids which would be plainly visible at the bottom of a container. Also, some are water soluble and others are not.

Precautions

The following general preventive measures are recommended for minimizing the hazards of peroxide formation in ethers:

1. Glass containers of all sizes should be avoided whenever possible.
2. All containers should be dated, so that the age of the contents may be determined.
3. Isopropyl and absolute ethers should not be kept for more than six months; ethyl and other ethers for not more than one year.
4. Ether should be stored in as cool a location as feasible (but not stored in refrigerators unless explosion-proof).
5. Ether should always be tested for peroxide content before any distillation procedure, and of course should not be used if peroxides are found to be present.

See page 13



PUBLICATIONS AVAILABLE

BULLETINS

Bulletin 103, "Safe Handling of LP Gas," gives the use and characteristics of LP gas and rules for safe handling.

Bulletin 104, "Ground It!" explains the need for grounding electrical hand tools.

Bulletin 106, "Ladders on the Farm," gives pointers to reduce the high rate of farm ladder injuries.

Bulletin 107, "The Ship-Shape Shop," shows the value of good house-keeping.

Bulletin 108, "Taming the Circular Saw," deals with a useful but dangerous tool.

Bulletin 110, "Tips for Hotel Workers," is a guide to safety in hotel work.

Bulletin 111, "Farm Safety Check List," is a safety guide for everyone on the farm.

Bulletin 117, "Stop Grinding Out Injuries!" describes abrasive wheel precautions.

Bulletin 120, "Safety Rules for Painters," shows how to prevent injuries to painters.

Bulletin 121, "Ladder Safety Step by Step," explains how to avoid ladder accidents.

Bulletin 122, "Handy Rules for Hand Tools," describes the proper care and use of many common tools.

Bulletin 125, "Are You Using Carbon Tet?" deals with a hazardous chemical.

Bulletin 127, "Look Out for Yourself When You Are Around Crop Spraying," is directed to the farm-workers. (Available in Spanish also.)

Bulletin 128, "If You Work in a Quarry," covers quarry and open-pit mine workers.

Bulletin 133, "Analysis of California Logging and Sawmill Fatalities," contains a study of logging and sawmill deaths in California.

Bulletin 135 (Rev.), "Check List of Requirements," is a guide for employers, safety engineers, and purchasing agents to show what they should check for before buying or renting equipment or placing contracts.

Bulletin 137, "Skin Trouble Is Plenty Trouble," deals with the most common disease you can get at work.

Bulletin 140, "Keep AWAY From Power Lines!" is about the hazards of overhead electric power lines. (Available in Spanish also.)

Bulletin 141, "Power Hand Saw Safety," gives causes of power hand saw injuries.

Bulletin 142, "Read and Understand the Label!" reminds us of a vital need.

Bulletin 143, "Trade Association Safety Programs," reveals their value.

Bulletin 144, "The Know-How of Wire Rope Safety," gives valuable pointers.

Bulletin 147, "The Safe Use of Anhydrous Ammonia in Agriculture," discusses the three most important things which, if remembered, make anhydrous ammonia safe to use.

Bulletin 148, "The Safe Use of Aqua Ammonia in Agriculture," describes the precautions necessary for safe use of aqua ammonia.

Bulletin 150, "Electrical Safety and Swimming Pools," describes precautions to make swimming pools safe electrically.

Bulletin 151, "Control of Noise in Industry," describes methods for either eliminating or controlling excessive noise.

Bulletin 153, "Electrical Safety on the Farm," tells how to guard against electrical hazards.

Bulletin 154, "The Tailgate Safety Meeting," gives pointers on an effective means of promoting on-the-job safety.

Bulletin 155, "Pesticide Regulations," tells how to guard against hazards in the use of pesticides containing organic phosphates.

Bulletin 158, "Protection of Workmen in Trenches," describes measures to reduce the heavy death toll in excavations.

Guard Standards, No. 1, Materials and Construction, gives invaluable advice on constructing guards and selecting the right materials for them.

Form 657, "Accident Prevention Program for the Construction Industry," contains requirements every construction employer must observe.

REPRINTS

Power Press Safety

Transportation of Workers—Current California Regulations

Lifting With Safety

Low-Voltage Temporary Power and Lighting Installations

Division Safety Order Can Apply to Protect the General Public...

GISC Aim, Scope, Organization, and Policies

How California's Safety Orders for Industry are Developed

Publications Available to You



PUBLICATIONS AVAILABLE

PLACARDS AND STICKERS

PLACARDS

Form 101, "Safe Handling of LP Gas," gives safe procedures for handling and installing LP gas units. 5½" x 8½"

Form 611, "Construction Hoisting Signals," gives bell or whistle signals required by Construction Safety Order 1612(c). 5½" x 7"

Form 612, "Notice: Fuse Used Here Burns at the Rate of One Foot in _____ Seconds," notice required by State Safety Orders 1571(a), 4115(b), 6128(b), 7268(b), 8474(a). 8½" x 11"

Form 615, "Stop Machinery before Oiling, Cleaning, Repairing." 8½" x 11"

Form 620, "All equipment shall be so positioned, equipped, or protected so that no part shall be capable of coming within 6 feet of high-voltage lines." Notice required by Construction Safety Order 1768(c). 8½" x 11"

Form 627, "Caution! Don't Go Between Brow Log and Load. Don't Dump Logs Until All Men Are Clear." For use at log dumps and ponds. 8½" x 11"

Form 634, "Responsibilities Prescribed in California Labor Code," lists them for employer and employee in matters of safety. 8½" x 11"

Form 669, "Unlawful to Operate This Equipment Within 6 Feet of High-Voltage Lines." Notice required by Electrical Safety Order 2603(c), Construction Safety Order 1768(c) and California Penal Code Sec. 385. 8½" x 11"

Form S-800, "Hand Signals for Boom Equipment Operation," shows approved arm and hand signals in pictures. 8½" x 11"

SAFETY ORDERS

The following safety orders are available from Documents Section, P.O. Box 20191, Sacramento 95820.

Where safety orders have been revised (as almost all of them have been), the date is the date of the latest revision.

Money orders or checks made payable to the Documents Section must accompany all purchase orders. Don't send stamps.

Documents Section gives a 10 percent discount on purchases of 50 or more copies of any one title.

Don't forget to add 4 percent sales tax if you live in California.

	Price	With Sales Tax
Aerial Passenger Tramway Safety Orders (1956).....	\$0.75	\$0.78
Boiler and Fired Pressure Vessel Safety Orders (1966).....	.75	.78
Compressed Air Safety Orders (1966).....	.75	.78
Construction Safety Orders (1965).....	2.00	2.08
Electrical Safety Orders (1962).....	2.00	2.08
Elevator Safety Orders (1954).....	1.50	1.56
General Industry Safety Orders (1963).....	1.50	1.56
Logging and Sawmill Safety Orders (1958).....	1.50	1.56
Mine Safety Orders (1958).....	1.00	1.04
Petroleum Safety Orders—Drilling and Production (1959).....	1.50	1.56
Petroleum Safety Orders—Refining, Transportation and Handling (1951).....	1.00	1.04
Pneumatic Explosives Loading Safety Orders (1944), Quarry and Open Pit Mine Safety Orders (1953).....	1.00	1.04
Ship and Boat Building Safety Orders (1961).....	.75	.78
Tunnel Safety Orders (1962).....	1.00	1.04
Unfired Pressure Vessel Safety Orders (1964).....	1.00	1.04
Window Cleaning Safety Orders (1952).....	.75	.78
Chapter 4 of Title 8, including all Safety Orders.....	16.00	16.64

STICKERS

Form 616, "Warning—This machine is automatically controlled and may start at any time." 3" x 5¼"

The bulletins, placards, and stickers are available to those interested in accident prevention. Requests for material should be sent to Division of Industrial Safety, Educational Section, 455 Golden Gate Avenue, San Francisco, California 94102, or to Division of Industrial Safety, Educational Section 3460 Wilshire Blvd., Los Angeles, California 90005.

If you require 1,000 or more copies you may obtain price quotations directly by writing to: Documents Section, P.O. Box 20191, Sacramento, California 95820. Then place your order with them.

Should you desire to reprint any of our safety publications, you may do so. Please write a credit line—Division of Industrial Safety, State of California—and send us one copy of reprint.

Ether Explosions

Continued from page 10

6. Do not attempt to open any containers of uncertain age or condition, or whose cap or stopper is tightly stuck.
7. Manufacturers should be contacted to learn any general recommendations regarding safe handling in storage and use, and any specific recommendations for the addition of inhibitors to prevent peroxide formation wherever possible. Manufacturers can also recommend regarding the best methods for chemical test to detect peroxide content, and for possible removal of peroxides by chemical means.
8. In addition to all the above, special precautions are appropriate to hospital use of ether for anesthesia. Section A 1113, Appendix A of N.B.F.U. No. 56, Standard for the Use of Flammable Anesthetics, states as follows:

"The Committee on Hospitals is cognizant of suggestions that the detonation of ether peroxides formed by the oxidation of ether over a period of time may be cause of explosions in anesthesia machines. This has not as yet been experimentally verified, but until further information is secured, frequent emptying of the ether bottle and cleaning of the ether evaporator inside anesthetizing locations would be a simple and desirable precaution."

9. Finally, if suspect containers are found in storage, do not undertake their removal and disposition on your own. Call the local fire authority. While there appears to be no evidence that peroxides in storage containers have exploded spontaneously, or even under gentle handling, there can be no assurance that this might not occur. Let the local fire authority determine the safest procedure for disposition of the material.

It's all right to follow orders, but a lot of people drown going through channels.



Bill Ross (right) plots group movements along highway with Sid Williams, Federal Government accountant.

"This job shall be completed without an accident" is the premise on which Bill Ross approaches all of his safety work.

Ross, a safety engineer with the Construction Section of the State Division of Industrial Safety, applied the same principle to a major landscaping project along a freeway through Yorba Linda, where he lives. He was co-director for several hundred volunteer workers who planted some 400 trees and 50,000 packets of flower seeds.

Prior to planting trees they were instructed on how to prevent back strain; they were briefed on the importance of leaving vehicles only by right-hand doors away from traffic; and they were cautioned against crossing the highway for any reason.

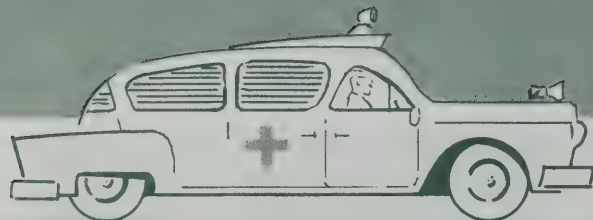
Flagmen posted at regular intervals within sight of one another kept traffic aware of the landscape parties. The flagmen wore red vests and white hard hats.

Cleanup after the planting was meticulous; good housekeeping contributed to injury prevention.

The project was planned for six months, and every move was plotted on a 30-foot topographic map.

"No accidents!" was the goal—and there was none.

For his part in this accomplishment Ross was recognized nationally. His biography appears in an annual compilation, *Outstanding Young Men of America*, published by the Montgomery, Alabama, Junior Chamber of Commerce.



It Needn't Have Happened

The Accident	The Unsafe Act	The Unsafe Condition	To Prevent Such Injuries
A farmworker was cleaning the milk pump in a dairy using gasoline as a solvent. The fumes were ignited by a nearby open flame.	Using gasoline to clean machinery.	Explosive vapors near open flame.	Using low-flashpoint solvent or a caustic solution.
A sawyer was helping change saw on headrig. The log carriage was not locked at the end of the run. While the sawyer was standing in the carriage runway, the steam operator turned on the steam to the sawmill. The carriage ran down the track and hit the employee.	Standing in the carriage way.	Carriage not locked at the end of runway.	To prevent such accidents, always lock log carriage when working in carriage way.
A woman employee in a metal working plant was operating a drill press. She had no protective covering over her hair. Hair caught in drill press spindle and she was partially scalped.	Working without protective equipment.	Exposed revolving spindle.	Women must wear hair protection around moving machinery.
An employee was loading a spray rig with phosdrin. He failed to use the rubber apron and funnel provided. He spilled a drop about the size of a 50-cent piece on his stomach. He simply washed the spot with water. The material was so toxic, he was convulsed and had to be taken to the hospital.	Not using protective equipment.	Handling toxic material.	Use protective equipment. If exposed, remove clothing, bathe, and dress with clean clothes.
A farmworker reached over revolving, unguarded power takeoff shaft to remove a vine wrapped around the shaft. His shirt sleeve was caught by the coupling pin and his arm pulled against the coupling. Luckily, the shirt sleeve was yanked from the shirt before the man lost his arm.	Reaching over a power takeoff shaft.	Unguarded power takeoff shaft.	All power takeoff shafts must be guarded.
An employee of a cleaning establishment put both hands in a press-type ironer to straighten out a garment. He accidentally tripped the foot pedal and his hands were caught.	Reaching into the bed of the press with both hands.	Lack of two-hand controls.	Press-type ironers must be so guarded that the operator cannot be caught between the ironing surfaces.
An employee in a sheet metal plant was operating an unguarded punch press. He put his hand under the ram and lost a finger.	Trying to beat the descending ram.	Unguarded point of operation.	All punch presses must have point-of-operation guards.
An employee dropped a rag that caught between a sprocket and chain drive that was only partially guarded. As he attempted to remove the rag, his knee struck the starting button and his fingers were pulled into the chain and sprocket.	Reaching into unguarded machinery.	Partially guarded chain and sprocket.	Guards must totally enclose chain and sprocket drive.
When operating a power mower, an employee noticed that the bolts holding the operating handle were loose. Without cutting off the motor, he reached under the side shield and his fingers contacted the revolving blades. Three fingers were amputated.	Reaching under the guard.	Revolving lawnmower blades.	Always turn off the power mower motor before working on machine.
A farmworker was grading potatoes on the main draper belt of a potato harvester. He reached out too far to get a potato and his hand was caught between the unguarded sprocket and chain at end of grading belt.	Putting hand on sprocket.	Unguarded chain and sprocket.	Install a guard to prevent contact with chain and sprocket.

Disabling Work Injuries^a and Injuries Per 1,000 Workers, by Industry, California, 1962-66

Industry	Disabling injuries per 1,000 workers				
	1962	1963	1964	1965 ^a	1966 ^a
All industries.....	31.5	31.8	32.3	31.3	31.8
Agriculture.....	65.1	67.9	66.0	68.3	65.6
Mineral extraction.....	71.7	70.5	65.9	61.9	66.7
Metal mining.....	88.8	66.7	74.1	58.6	73.2
Crude petroleum and natural gas production.....	75.7	73.3	69.2	70.1	73.6
Nonmetallic mining and quarrying.....	56.8	63.8	55.7	40.6	45.2
Construction.....	80.4	81.9	82.9	76.1	73.1
General building contractors and operative builders.....	81.2	86.1	85.8	75.7	67.3
General contractors, other than building.....	77.8	72.5	73.8	67.3	71.9
Special trade contractors.....	81.1	83.1	84.8	80.5	77.5
Manufacturing.....	30.2	30.7	32.4	33.5	36.6
Food and kindred products.....	59.1	61.5	63.0	64.9	68.5
Textile mill products.....	36.8	39.3	40.4	49.2	47.2
Apparel and other fabricated textile products.....	12.9	13.2	13.2	13.1	15.5
Lumber and wood products (except furniture).....	100.4	102.9	101.0	96.5	96.3
Furniture and fixtures.....	50.6	55.3	58.5	58.3	58.3
Paper and allied products.....	27.2	27.3	26.5	27.4	34.5
Printing, publishing, and allied industries.....	22.0	21.4	21.4	21.0	22.7
Chemicals and allied products.....	28.6	28.4	30.4	33.6	37.7
Petroleum products.....	11.2	12.7	12.2	12.8	14.0
Rubber and miscellaneous plastics products.....	49.1	46.8	52.0	56.5	69.5
Leather and leather products.....	31.0	21.4	30.5	28.8	31.3
Stone, clay, and glass products.....	44.2	45.5	49.4	45.5	45.9
Primary metal industries.....	43.7	45.1	47.2	52.2	63.3
Fabricated metal products.....	46.7	46.3	46.9	52.4	62.6
Machinery (except electrical).....	32.5	30.4	31.7	34.1	38.6
Electrical machinery, equipment, and supplies.....	11.6	11.9	11.8	12.3	14.2
Transportation equipment.....	14.8	15.6	18.7	19.7	22.2
Motor vehicles and equipment.....	26.5	29.8	35.3	34.5	43.8
Aircraft and parts.....	9.1	9.2	10.2	11.1	13.2
Ship and boat building and repairing.....	39.3	37.0	46.5	46.6	46.9
Instruments and related products.....	16.1	19.2	16.2	19.2	21.5
Miscellaneous manufacturing industries.....	29.2	28.9	33.2	32.1	33.6
Transportation, communication, and utilities^b.....	40.2	38.5	39.1	39.1	39.9
Street, highway, and local railway passenger transportation.....	47.4	50.2	52.6	53.9	53.1
Motor freight transportation and warehousing.....	88.8	87.1	89.8	89.4	91.8
Air transportation and allied services.....	36.4	27.1	32.0	36.6	43.1
Other transportation services (except water).....	43.8	41.3	37.9	32.1	28.1
Communication.....	6.0	5.8	5.6	6.1	6.6
Utilities.....	33.0	32.0	32.4	32.2	32.1
Trade.....	26.6	26.9	27.8	26.6	27.3
Wholesale.....	26.7	25.9	28.2	25.7	27.3
Retail.....	26.6	27.3	27.7	26.9	27.3
Building material, hardware, and farm equipment.....	43.4	44.9	43.2	37.2	36.5
General merchandise.....	15.9	16.6	17.5	19.4	19.4
Food stores.....	37.0	38.8	39.2	37.6	39.3
Automotive dealers and gasoline service stations.....	34.4	33.7	34.8	33.5	34.2
Apparel and accessories.....	8.5	8.5	8.4	8.7	9.0
Furniture, home furnishings, and equipment.....	24.4	26.3	24.3	23.8	26.3
Eating and drinking places.....	29.7	31.1	31.5	29.6	30.2
Miscellaneous retail trade.....	17.3	17.2	17.6	17.3	16.7
Finance, insurance, and real estate.....	7.7	8.2	8.2	8.2	8.6
Service.....	16.9	16.5	17.1	16.6	17.1
Hotels and lodging places.....	28.8	29.6	31.0	30.4	29.7
Personal services.....	16.1	15.0	15.8	14.9	15.6
Business services.....	17.9	17.5	19.3	18.9	19.1
Automobile repair services and garages.....	51.2	51.1	53.4	47.4	51.0
Miscellaneous repair services.....	43.2	42.0	39.7	40.9	38.2
Motion pictures.....	11.4	12.8	12.2	13.5	13.0
Amusement and recreation services.....	31.6	29.6	31.6	30.3	29.8
Medical and other services.....	18.2	17.3	17.2	17.4	19.0
Educational services—private.....	11.9	11.5	10.8	11.5	11.2
Private households.....	6.0	5.4	5.1	4.3	3.5
Miscellaneous services.....	9.0	8.5	9.0	8.2	9.7
Government, State and local^b.....	31.5	32.3	31.6	30.6	29.6
State.....	28.2	26.2	25.5	25.1	24.1
Local.....	32.5	34.0	33.4	32.2	31.2

^a Rates for 1965 and 1966 are preliminary and are subject to revision.

^b Injuries to and employment of workers in publicly operated utilities are included under State and local government.

Source: Division of Labor Statistics and Research.



Load of logs on way to sawmill

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CALIFORNIA SAFETY NEWS

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April 1967





ALBERT C. BEESON APPOINTED DIRECTOR

On April 5, 1967, Governor Ronald Reagan appointed Albert C. Beeson Director of the Department of Industrial Relations. He succeeds Mrs. Margaret R. O'Grady, who was interim Director.

Mr. Beeson was vice president of the San Francisco management consultant firm of Case & Co. He has had broad experience in the field of labor relations and was a member of the National Labor Relations Board under President Eisenhower.

The new Director is a graduate of Stanford University, with a masters degree in business administration from New York University. Since 1963 he has been an assistant professor of industrial relations at San Jose State College, specializing in personnel management, labor relations, and economics.

HATTON NAMED SAFETY CHIEF



Roy J. Bell, Administrative Director, Division of Industrial Accidents, swears in Jack F. Hatton as Chief, Division of Industrial Safety, with Margaret R. O'Grady, Deputy Director of Department of Industrial Relations, as witness

On March 1, 1967, Jack F. Hatton of Inglewood, former Chief Safety Engineer of Lockheed Aircraft Corporation for 28 years, was appointed by Governor Ronald Reagan as Chief of the Division of Industrial Safety.

Hatton has been a member of the Industrial Safety Board since it was established in 1945 and has served continuously prior to accepting the position as Chief of the Division.

He has served as President of the American Society of Safety Engineers, Greater Los Angeles Chapter, and as President of the Southern California Industrial Safety Society, as well as President of the Aircraft Manufacturers Safety Council. He has been a Director of the National Safety Council, Greater Los Angeles Chapter, and President of the Aircraft Section of the National Safety Council in Chicago. Mr. Hatton has a Mechanical Engineering Degree from USC, and in addition to his other activities has taught classes in safety at San Fernando Valley State College and the University of California at Berkeley and Los Angeles.

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RONALD REAGAN.....Governor of California

ALBERT C. BEESON.....Director of Department

JACK F. HATTON.....Chief of Division

INDUSTRIAL SAFETY BOARD

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SEWELL A. KNAPP, *Editor*

MARJOLAINE O'NEILL, *Graphic Artist*

The pictures of the Industrial Safety Conference were taken by P. T. Donohoe, Safety Engineer with the Division of Industrial Safety.

The pictures of the swearing-in of Jack F. Hatton, Chief of the Division of Industrial Safety, and the individual picture of Mr. Hatton were taken by G. W. Jewett, Safety Engineer with the Division of Industrial Safety.

The picture on this month's cover shows the city of Esbjerg, Denmark. The location of the dark sphere in the center presents a safety problem that is discussed in detail on page 12.

YOU AND ELECTRICITY AT HOME

Electricity has been a godsend to the home. It has made life much more comfortable, and house work much easier. But it is not an unmixed blessing.

Wiring and lights, power to operate the many appliances and tools in the home have introduced new dangers to life and limb unless safe practices are followed.

Electricity in your home can be either a servant or a killer and pyromaniac. It all depends on how you treat and handle it.

More people are killed annually by 110 volt house circuits than any other voltage, and it takes less electricity to kill than it does to light a 10 watt light bulb.

Here are a few basic rules to follow that will help prevent injury or fire in your home:

1. Make sure that all appliances, cords, and plugs carry the Underwriter's Laboratories Label.
2. Do not overload a circuit.—Most lighting circuits are fused at 15 amps. Do not use a larger fuse.
3. Replace all worn or frayed cords.
4. Do not run extension cords under rugs or between a door and its frame.
5. Make sure that all appliances and portable electric tools are grounded.
6. When laundry equipment is installed, a separate fused circuit should be added from the main circuit panel.
7. All outlet boxes and switches should have cover plates.
8. Make sure that no light switches or electrical appliances are within reach of the bathtub or shower.
9. When a fuse blows, you have either a short circuit or an overload. Turn off master switch, locate blown fuse. (You should have a list on the fuse box door, indicating the circuit for each fuse.) And unplug the appliances on the circuit. Then install new fuse. (If you do not know the proper size fuse to use, check with a licensed electrician.)
10. Don't change fuse in dark (use flashlight) or when standing on a damp or wet floor.

11. Never replace a fuse by putting a penny behind the blown fuse or by wiring around the fuse.

12. Always pull on the plug (never the wire) when disconnecting appliances, light cords, or extension cords from outlets.

13. When replacing a broken bulb, make sure that the circuit is dead and always use insulated pliers to remove bulb base. (Never your fingers.)

14. Be sure that there is a protective guard around the bulb on each extension cord.

15. Never, but never remove the back plate of your television while the set is plugged in.

16. Never work on any circuit unless the fuse has been removed and the circuit killed.

17. As an aid to fire prevention, do not leave appliances or TV "on" while no one is in the house to attend them.

18. Do not use cords as a substitute for permanent and properly installed wiring.

19. Don't use lamp sockets to supply current for appliances. Use the wall outlet.

20. Unless qualified, do not attempt to repair electrical appliances; call a licensed electrician. In fact, it is a good policy to call him whenever you have any electrical problem.

Check List for Your Home

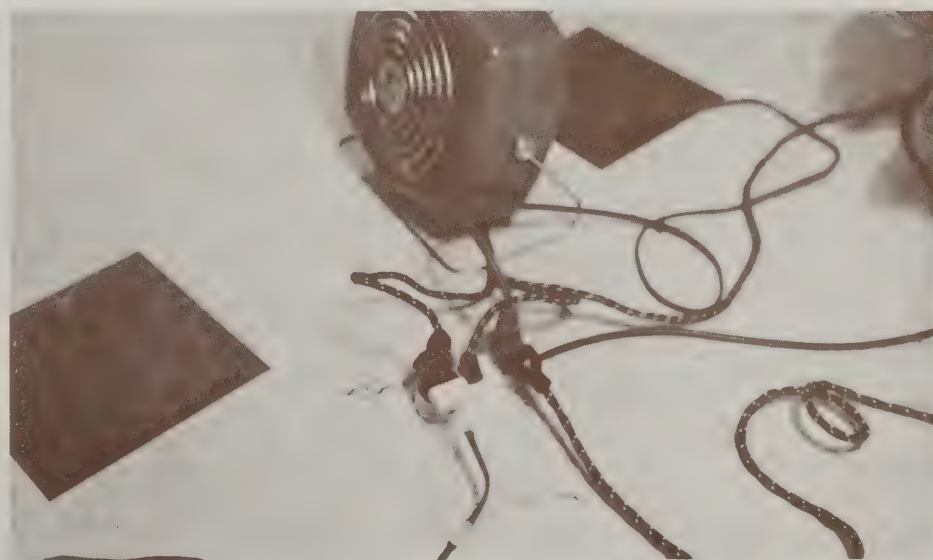
	Yes	No
1. Are all lamp, appliance and extension cords in good condition?.....	<input type="checkbox"/>	<input type="checkbox"/>
2. Are all plugs in good repair?.....	<input type="checkbox"/>	<input type="checkbox"/>
3. Are all wire connections in plugs completely enclosed?	<input type="checkbox"/>	<input type="checkbox"/>
4. Are all appliances grounded properly?	<input type="checkbox"/>	<input type="checkbox"/>
5. Are all extension lights protected by guards?	<input type="checkbox"/>	<input type="checkbox"/>
6. Do all wall switches and outlets have plates installed?	<input type="checkbox"/>	<input type="checkbox"/>
7. Does your fuse box have a list identifying each circuit?.....	<input type="checkbox"/>	<input type="checkbox"/>
8. Does your TV have a properly installed back plate?	<input type="checkbox"/>	<input type="checkbox"/>
9. Are all electric appliances out of reach of the bathtub?.....	<input type="checkbox"/>	<input type="checkbox"/>
10. Is the floor in front of your fuse box dry or do you have a dry wooden platform there?	<input type="checkbox"/>	<input type="checkbox"/>
11. Do your fuses "blow" frequently?	<input type="checkbox"/>	<input type="checkbox"/>
12. Are extension cords used for additional outlets?	<input type="checkbox"/>	<input type="checkbox"/>

You should be able to answer the first ten questions with a "YES" and the last two with a "NO."

One or more wrong answers will indicate the possibility of serious defects which can cause trouble. We recommend that you call in a licensed electrician to correct the defects.

This article is reprinted from the *Electrical Workers Journal*, January 1967.

Frayed cord, multiple outlet plugs, and overloaded circuit make this a booby trap.



IDEAS IN ACTION

Some Highlights of the Address

By Walter R. Farrell

Vice President, Industrial and
Union Relations

Kaiser Industries Corporation

... I will try to list some of the reasons why I think we should be gathered here at such an annual meeting.

First, I suggest we should be here to review two closely related factual issues. On the one hand, we need to determine where we are today in the area of safety and what we have accomplished since some point of reference ... eight years ago, when Henry, Jr. appeared on this platform. ...

Then, it seems to me, we need to ask ourselves a second question—and this, obviously, not for the first time—“Where are we going?” “What are our safety objectives for the future?”

So far, I am sure that I am plowing familiar ground—material you have been going over, year after year, in these annual meetings and in various other safety meetings throughout the year. After all, such meetings are usually devoted to the same theme—generating ideas for improving our safety performance. ...

Ideas in Action

This leads me to the title of my talk—IDEAS IN ACTION ... And this, I challenge you, should be our last and most important question for discussion at this conference: *how can we—together—effectively apply the ideas we come up with in order to reach the safety objectives we set for ourselves during these sessions?*

... Where are we today? In 1959, when Henry, Jr., spoke, we in California had completed 1958 with a new record low of just under 32 disabling injuries per thousand workers. I don't know what our final 1966 figure will be, but I do know that in 1965 we again achieved a new, all-time low. It was 31.3 injuries per thousand workers. ... For all practical purposes, then, despite this record performance, we have been on a virtual plateau as far as our disabling injury rates are concerned. Can we be satisfied with this level of performance?

If we could be, we wouldn't be here today looking for new approaches—new ideas. ...

So in spite of our efforts, we are practically at a standstill. Why should this be so? Certainly we haven't stopped our safety efforts. ...

... we had 659 deaths in California in 1958—and we had 723 in 1966. Is that progress? Workmen's compensation benefits under insured programs were \$127 million in 1958—and \$238 million in 1965; while self-insured benefits went from \$5 million to almost \$24 million over the same period. Is that the kind of progress we want? ...

Major Problems

... Let's take a quick look at some of the major problems with which we are trying to cope at the present time. ...

1. We are developing and putting new technology into operation at an ever increasing rate. This means more new equipment, materials and processes than we've ever had before—and they pose new types of safety problems. ...
2. As industry expands in California, we are continually hiring more new, young, inexperienced employees, all of whom need to be thoroughly educated to safety. ...
3. A third source of problems recently has been that many organizations have been experiencing “growing pains,” whether from straight growth, or mergers, or acquisitions. ... Obviously, such changes can have a major impact on safety as well as other types of programs.
4. I'm not here to pick on my many union friends, but I do know we've had situations where union representatives have raised safety as a false issue for purposes of negotiation on other items. ... I'm talking about instances where safety issues are literally created out of whole cloth to justify a work-stoppage or threat of a stoppage which otherwise would not be permitted under an existing agreement. ... In those instances where safety becomes a pawn to be played with by labor—or management—believe me,



any *real* safety program goes down the drain in an awful hurry! Another problem ... is the role of discipline ... if we had complete agreement on a cooperative approach to safety—and the function of discipline, therein—we could eliminate a great deal of the present controversy. ...

... In a democratic society, our primary concern is for the well-being of the individual citizen. In safety, it is the waste—not of dollars and cents, however much we may use these terms in our discussion and evaluation—but the waste of human life that is our ultimate concern. Therefore, the fundamental objective of our society is to protect the individual. ...

To round out our objective I suggest we have to ask a further question: “Who is responsible for safety?”

Is it management's responsibility? I am sure we can agree, here, to a “Yes, partly” type of answer. ...

Is it organized labor's responsibility? Yes, partly. ...

Is it government's responsibility? Still, the answer must be a “Yes, partly.” ...

Is it the responsibility of those of you who are professional health and safety experts? Surely, but again—partly. ...

See page 6



LABOR AND SAFETY

Some Highlights of the Address

By William Sidell

Second General Vice President

United Brotherhood of Carpenters & Joiners of America

... I want to emphasize the broad picture of safety as it appears from the vantage point of an international union—and indeed from the viewpoint of organized labor in general. . . .

Safety is a big subject; and like everyone else, the members of organized labor have a stake in protecting their lives and health in all their activities, both on and off the job. . . . I will, of course, concentrate on occupational safety. . . .

... I want to discuss in some detail the way in which we look at collective bargaining for safety—with special attention to management and union attitudes which affect our ability to work together for maximum safety on the job. Then I'll go on to a discussion of state and federal safety codes and their enforcement.

Perhaps if labor and management were doing a better job, this would not be such an urgent problem. But as it stands today, the low level of safety performance by both federal and state governments is depriving millions of workers of the protection they desperately need. . . .

Management Attitudes

... a few words about management attitudes. As far as safety is concerned, there are, from labor's point of view, three kinds of employers.

The first kind doesn't realize or doesn't care about his obligation to protect the lives and health of his employees. . . . Such an employer might typically reply that he paid his workers good wages; . . . and if they don't have sense enough to take care of themselves that's their fault, not his. This refugee from the Dark Ages represents a small minority of employers; but there are more of them than you would think. . . . Unfortunately he is most often found in non-union plants; and there's not much we can do about educating him until we can figure out a way to get him organized. In all honesty I should add that there are plenty of union plants and jobs where the union and the workers need educating as badly as the boss does. . . .

The second type of employer is, fortunately, far more numerous than the first—though from the union point of view he can sometimes be almost as frustrating to deal with.

Such an employer, whether large or small, is genuinely concerned with the safety and health of his employees. . . . He has a more or less formal and complete safety program; and he puts time and money into making it work . . . it pays off not only in fewer accidents to his employees but in dollars and cents to himself. So he's completely sold on safety and keeps working to improve his program and reduce his accident frequency rate. But then sooner or later . . . those accident rates come to a standstill or maybe start edging back up.

... further progress depends on . . . the enthusiastic cooperation and involvement of his workers. We like to think that the best way . . . is to enlist the active participation and partnership of . . . their union.

An employer who decides . . . that unions have no legitimate interest in workers safety programs will continue to do his best to go it alone. We on the contrary believe that safety is a mutual interest of management and labor. . . .

This brings us to our third type of employer. Like the second, he too wants to do what he can to insure the safety and health of his workers; but he realizes he needs all the help he can get—even if it has to come from a union.

There are many employers like this one who have found that recognizing and building on this mutual interest of management and labor is the best way to get the best in safety for their employees . . . without giving up any of their . . . management prerogatives. In the labor movement we recognize that the ultimate responsibility of providing a safe workplace rests with management. . . .

Collective Bargaining

Now regardless of management's attitudes on the proper role of unions in industrial safety, the basic way in which we can express our legitimate interest in the safety and health of our members is through collective bargaining. The natural place to start is with a safety clause in the union agreement. . . .

Obviously a safety clause is only the beginning of a joint labor-management safety program. To achieve a functioning joint safety committee that can get action from management and intelligent reaction and participation from workers is not an easy task. It takes the same kind of day-to-day attention to detail and resolving of differences that unions and management use to work out all their other problems.

... now let me indulge in a bit of self-criticism. Unions, and their officers and members, aren't perfect either. They are, after all, a very significant part of the general population; and it takes only a glance at accident trends of all kinds to make it clear that the American people just aren't sold on safety. . . .

In spite of such shortcomings . . . I can honestly say that organized labor . . . (is) showing a more constructive and sincere interest in safety than ever before.

... And now . . . I'm ready to turn to the subject of safety legislation and regulation.

See page 6

LABOR AND SAFETY

... Nobody likes to be regulated. And even when the necessity of regulation has been generally conceded, there is often violent disagreement on who shall do the regulating. Shall a city, county, or state be given jurisdiction over a specific activity?

... States today ... are generally charged with the responsibility for enacting and enforcing legislation to insure that their citizens work under reasonably safe and healthful conditions. ...

State Responsibility

... we do believe that good safety codes, properly enforced at any political level can and do save the lives and health of our members. Your recent experience in California in beefing up your construction safety enforcement means that my own union has quite a few live and healthy members who wouldn't be with us today if the State of California hadn't done something about it. That's the kind of performance the labor movement wants at all levels of government.

... Whether for collective bargaining or for government regulation, standards or codes are needed to set up the ground rules for safe conditions and safe practice. ...

... Here (in California) you have an active labor movement and a state government that has shown some real concern for the safety and health of its workers. Compared with most of the rest of the country, California has made great progress. Last year, in the construction industry, you demonstrated that an investment in money and manpower and efficient administration can save lives and preserve the health of workers. ...

... I trust that you will build on the achievements of the past few years. ... consistently and significantly reducing work injuries in California to the lowest possible level.

If You Move—

If you move, and wish to continue receiving the CSN, please notify us of your new address.

IDEAS IN ACTION

Whose Responsibility?

How often, however, have we stopped at this point and said "Great, now if we can only get all four of these groups to cooperate, we can solve all of our problems!" But have we? Absolutely not! ...

Is the individual responsible? ... in a democratic organization, the individual also has a basic, and unavoidable responsibility to himself—and to society—for his own safety and the safety of those with whom he works.

... the Kaiser companies ... have now formally stated that the purpose of our safety program is: "to assist the employee to recognize, understand and control the hazards of his job." ...

... the Kaiser companies have a motto. ... It is: TOGETHER WE BUILD. ...

... no matter how we have used this motto—whether to stress our building of men, or our building with safety—the key is never the "building"—it is the "togetherness." ...

Now, I realize this is not a new—or even a very radical concept. On the contrary, if anything, it has become an overworked and almost trite expression. This, however, does not alter the truth of the statement. What it does suggest is that it is a good idea that has been overworked in talk—but all too often neglected in practice. Remember, it is only the idea in *action* that gets results.

... if we are going to reduce accidents:

Each of us has to use his unique skills, knowledge and position to locate, analyze and define each safety problems as a *mutual* problem.

These problems must be approached on a common, dedicated and continuing basis in order to develop sound ideas for their solution.

Ideas, once developed, must be translated into sound, forceful, cooperative action.

Remember, it is our ideas in action that solve problems. ...

Massachusetts is credited with having the first safety regulations with the force of law. In 1877, an inspectorate with authority behind it was established by the Legislature.

Jack Valov, Construction Section Supervisor, Dies Suddenly at 48

Jack Moses Valov, Construction Supervising Engineer, suddenly and unexpectedly died of a coronary thrombosis at his Orinda residence, January 8.

Valov, who was 48, joined civil service in 1957 as a construction superintendent with the Division of Architecture and subsequently worked as a Construction Safety Engineer in the Los Angeles area with the Division of Industrial Safety. He served also as District Engineer with the Pressure Vessel Section for over two years.

He was appointed Supervising Safety Engineer (Construction) in 1962.

Prior to civil service, Valov worked in building and bridge construction with Southern Pacific Railroad, and as a building inspector for the County of Los Angeles. He served with the U.S. Army in Alaska during World War II. He taught languages to service personnel at Adak and was an interpreter for the U.S. Navy.

He was a member of the American Society of Safety Engineers, San Francisco Chapter; Acalanes Lodge No. 723, F. & A.M. of Lafayette, California; Union of State Employees, Local 411; California State Employees Association; Marin Rod and Gun Club and the United Christian Molokan Church, Los Angeles.

* * *

Safety Board Appointments

Two appointments to the Industrial Safety Board were made recently by Governor Ronald Reagan.

On December 29, 1966 Antony Guerrero was appointed to the Board. Mr. Guerrero is a rancher and farm labor contractor from Modesto and is active in local youth movements.

The most recent appointment to the Board was that of Albert W. Turner, supervisor of employee relations of the Southern California Gas Company. Mr. Turner is a graduate of St. Edwards University with a degree in journalism. He has worked closely with the Division of Industrial Safety for many years and helped develop the General Industry and Petroleum Safety Orders.

Summation of Conference Meetings

AGRICULTURE SECTION

A. J. Ford and R. R. Douglas from California Packing Corporation opened the Section meeting with the subject "How to Develop and Maintain a Good Labor Force."

The presentation stressed the safety activity of Calpak's agricultural operations. All supervisors were trained in using visual aids and the importance of such material was stressed.

The corporation obtained all available farm safety information and then reworked and slanted this material toward its own operations.

By ingenuity and resourcefulness Calpak developed an economical and highly efficient farm safety program.

As a climax to their talk Mr. Ford and Mr. Douglas showed Calpak's new sound color film "Safe Travelin'."

Production and safety activities of the Coastal Growers Association of Oxnard was the theme of the talk by association manager, William V. Lloyd, Jr. He demonstrated how safety and production are co-partners.

Floyd McCall, agricultural engineer and Riverside County supervisor answered the question "Can You Afford to Lose a Trained Man?" He stated that with mechanization it becomes necessary to have trained equipment operators, and when such a man is injured his loss is felt much more than that of an untrained field hand.

Ralph R. Parks, education director (Emeritus) Agriculture Engineering, University of California at Davis, summed up the day's program with a round table discussion.

One of the major programs of the American Medical Association this year is "Medical Emergencies in Rural Areas," and this was the subject of the talk by Dr. L. J. Snyder, opening the second day.

Rural areas have the disadvantages of distance between towns, poor communications, and in many cases, too few doctors.

In addition to studying means of solving these problems, the American Medical Association considers active accident prevention programs and widespread first-aid training as an immediate "must" in rural areas.

GOVERNMENTAL AGENCIES

The opening speaker, Dr. Hamilton M. Moody, had for his subject "Psychology of Accident Proneness." Some of the points he made were that accidents are not by chance; they may be due to emotional disturbance and the inability of an individual to cope with stress. To get to the root of this unconscious motivation, the subordinate should be encouraged to talk back to you and if it is suspected an individual is having more accidents than he should, get individual counseling. Two-way communication is the key to preventing accidents.

The next speaker was Gerard A. Wyss of Los Angeles Water and Power. He showed a film on "Work Area Protection" dealing with various types of warning signs and equipment.

Ralph W. Venus, Chief Construction Inspector Engineering, Bureau of Contracts and Administration, spoke next on procedures to make construction areas safe: *To warn* the public on change of conditions; *to guide* by signs and barricades through such areas; *to stress* warnings with signs that do not confuse; and *to protect* the workmen from traffic at site by use of barricades, flashers, signs, linemen to direct traffic, etc. A manual is in preparation dealing with standardization in work area protective measures which will apply to any type of construction.

The opening speaker of the second session was George Sanders of the State Compensation Insurance Fund, Los Angeles, who spoke on "Firemen Protect Us—Workmen's Compensation Protects Firemen." Points made were: to provide for complete medical care on an open basis; to offer rehabilitation by physical restoration of the injured fire fighters; to consider the whole man, to reexamine basic accident causes, and to have periodical medical reviews to protect the employee and his family.

The closing speaker was Bob Madden, Battalion Chief of El Monte Fire Department, whose topic was "Modern Technology in the Fire Service." He emphasized that safety costs money and that protection is the most expensive commodity in the world.



Section Me



**SAFETY BOARD MEMBERS
AND CONFERENCE
SPEAKERS:** Jack F. Hatton, Virgil L.
Collins, Geo. A. Sherman, William Si-
dell, Walter R. Farrell

MANUFACTURING SECTION: Jack F. Hatton, Wm. S. Rhodes, Gilbert L. Rhodes, John Choch-
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hew A. Kuhta



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MINERAL INDUSTRIES: Robert D. Bailey, Silas L. Yount, A. L.
Moody, Jack L. Gordon, James J. McGlade, Larry L. McCune



etings — Industrial Safety Conference



GOVERNMENTAL AGENCIES: Edwin Aronson, Howard Husted, Robert S. Ford, Duane Hendrickson

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Andrew T. Brozik, Harry A. Kuschmann, Mark J. O'Reilly

TRANSPORTATION, COMMUNICATIONS, UTILITIES:

Linn Magoffin, Gordon Brown, Nate DiBiasi



CONSTRUCTION SECTION: Willis R. Pugh, Arthur T. Eisele, Gary H. Bronneck, Leo R. Westwater, Edmund Gale, John Tennison

AGRICULTURE: John O. Barnes, Willard L. Pippitt, Ralph R. Parks, Floyd McCall, Miles W. Kratka, Cliff H. Jameson, William V. Lloyd, Jr., A. J. Ford, Robert R. Douglas





MINERAL INDUSTRIES

The opening speaker was Mrs. Jean Powers of the Division of Labor Statistics and Research. She pointed out that the most frequent accidents are to vehicles, and that there is an increase in disabling injuries in 1966 in metal mining and nonmetallic mining, attributing it to the number of new mining ventures and lack of experienced miners available.

Dale Marr of the International Union of Operating Engineers Local 3, followed; his topic was "Labor's Responsibility Toward a Safety Program."

The final speaker was J. S. Russell of Thums Long Beach Company, who spoke on the Company's development of East Wilmington oil field—an operation spectacular with hazards of moving heavy equipment and petroleum drilling rigs.

A film presented by the Caterpillar Tractor Company, "Roll of the Drums" opened the second session. It dealt with heavy equipment used in open pit type mining and stressed necessity for safety indoctrination of operators.

An exposition followed by J. Robert Signer of the Division of Industrial Safety, of Federal Mining Legislation Public Law No. 89577.

The closing speaker was Donald Reining of Southern California Rock Products and Southern California Ready-Mixed Concrete Association. He discussed "Safety Program of Rock and Sand Quarry Industries" and used excellent slides to illustrate his talk.

TRADES AND SERVICES SECTION

"Basic and Practical Safety Programs" was the first subject on the agenda. This was a panel discussion featuring Sheldon Balzac (Lawry's Prime Rib), Hans Ewald (Clifton Cafeterias) and Robert Riley (Southern California and California State Restaurant Association). All panelists agreed that thorough training of employees is the major key to preventing accidents.

The closing session offered "How to Safety-Survey for Accident Prevention in Your Operation" by Charles A. Kleinwachter of State Compensation Insurance Fund, Sacramento, and "Workmen's Compensation Insurance Program Under Today's Regulations" by Gordon R. Stark from the State Compensation Insurance Fund, Los Angeles.



MANUFACTURING SECTION

Jack F. Hatton, then Safety Director of Lockheed Aircraft Company, gave the opening talk on "The Real Cause of Accidents." This is, quite simply, human error; mistakes made by individuals are the major cause of all accidents at work, on the highway and in the home. Hence the responsibility is great, to teach and train people how to work right—and this rests on the supervisors. They must provide guidance and leadership, and in turn, must be supported by management. The primary reason for accident prevention is humanitarianism and industry has a moral obligation to do all it can to prevent a man from being injured. A good safety program produces an industrial relations benefit also, for the worker respects his employer who cares about his benefit and he will, in turn, work better. Accident prevention is good economics, for accidents are costly both to employer and employee.

Dr. Edward Stainbrook, Chief Psychiatrist University of Southern California, next spoke on "How to Motivate People to Work Safely." He stressed that one must arrange the organization so that the people in it are emotionally involved and interested in their work. Here good communications plays an important part—keeping the employee informed about his company and what is going on. When an employee is hostile it is necessary to find the source of his anger, which might be with himself or with someone in authority or with the administration. Also the way top management conducts itself and handles its own communications, tensions and self development, tends to be felt through the whole organization and affects the accident rate and morale of the employees.

The second day session opened with a talk by Betty Colucci of Atlantic Research Corporation on "The Role the Industrial Nurse Plays in Safety." She stressed the importance of a health program, keeping records, having a training program, absentee control, awareness of stress symptoms in an accident victim and the routine services given to the injured.

The second presentation was a clever quiz conducted by Gilbert L. Rhodes of Sandia Corporation, Livermore, titled "I.S.Q.—What Is Your Industrial Safety Quotient?" It was an outstanding feature of the session.

The final portion of the program was given by Robert C. Miller of Hunt Foods & Industries, Inc., Hayward.

Summation of Conference Meetings

CONSTRUCTION SECTION

There were three main speakers at the opening session:

Edward P. Searby, safety director of the J. F. Shea Company, Inc., gave a history of the trends in tunnel construction, including the increased safety problems of the existing and future mechanized methods.

Maurice I. Gershenson, Chief, Division of Labor Statistics and Research spoke on injury trends, pointing out that statistics help by showing troubled areas where action is required to prevent accidents. In response to recommendation for more detailed information on accidents, these now are classified by occupation, areas, industrial trends and there is a special study on back-up injuries.

John Cinquemani, executive secretary, Los Angeles Building and Construction Trades Council, discussed the safety picture and ways to improve it, such as by allotting more budget to safety engineers, technicians and research.

Geo. A. Sherman, Secretary of the Conference, and Arthur Eisele, Cochairman, presented memorials to the late Jack Valov, Supervisor of the Construction Section of the Division of Industrial Safety.

The second session was opened with "discussion and adoption of recommendations" followed by a talk by Anthony Ramos, executive secretary of State Council of Carpenters on "Labor's Responsibilities in the Safety Program."

The closing speaker was Jacob Gold from the Bureau of Labor Standards who spoke on "So You're for Safety."

FOREST PRODUCT SECTION

The opening day speakers were Carl Nemethi, M.D., Industrial Medical and Surgical Clinic, Los Angeles, who discussed "Pre-Placement Physicals" and S. J. Hillman from State Compensation Insurance Fund, Los Angeles, who spoke on "Workmen's Compensation Trends."

Doctor Nemethi stressed the advantages to both employer and employee in establishing the health history of newly hired employees.

Mr. Hillman compared accident trends with employment trends and suggested ways to lower the accident rate.

The last day speakers were A. M. Smith, with A. M. Smith and Associates, and John C. Mader of Employers Insurance of Wausau.

Mr. Smith asked the question "Are Your Employees Indoctrinating You?"; and he made the point that telling an employee *WHY* certain instructions are given, will aid in reducing accidents.

Mr. Mader stated that a thorough investigation of all accidents and evaluation of the facts will play a large part in preventing reoccurrence.

TRANSPORTATION, COMMUNICATIONS, UTILITIES SECTION

A report on this Section was given by committeeman George W. Smith, Business Manager and Financial Secretary of I.B.E.W. Local #18.

The "How's and Why's of Rate Making" was presented by Robert Zasso and Dennis Cobb of State Compensation Insurance Fund.

Donald W. Moore, Department of Water and Power, Los Angeles, spoke on "How Does Top Management Know What's Happening?"

With Nate DiBiasi presiding, a panel of experts from California Highway Patrol discussed "School Bus Transportation Problems."

The second session was opened by the Pacific Telephone & Telegraph Company's demonstration on safety.

This was followed by speaker Roy Bell, newly appointed Administrative Director of Workmen's Compensation Appeals Board, Division of Industrial Accidents, who spoke on "Workmen's Compensation—Changes in Laws and Reorganization of the Workmen's Compensation Appeals Board." He was assisted by attorney Gordon Winbigler, presiding referee in Los Angeles.



Safety Survey of Anhydrous Ammonia

Aid Requested



CHAUNCEY WEISMAN
Senior Safety Engineer
Pressure Vessel Section
Division of Industrial Safety

Late last year the Division of Industrial Safety was honored by having one of its senior engineers chosen as an international expert on the handling, transportation and storage of anhydrous ammonia.

A tank for storage of anhydrous ammonia was erected in the harbor area of Esbjerg, Denmark.

The sphere is 71 feet diameter and holds 1,430,000 net gallons of ammonia and is so located as to constitute an environmental hazard to the city of Esbjerg, population 70,000 approximately. The city is on an isthmus jutting into the North Sea and is the most important fishing port in Denmark.

In case of a release of ammonia, the major escape routes from the city would be in a direction toward the sphere, or evacuation by boat, both of which would be difficult and time-consuming. The prevailing winds are from the sphere toward the city.

The sphere was constructed, installed and tested over 2 years ago by a Danish corporation in the business of supplying fertilizer, but the Danish Department of the Interior has not permitted it to be used due to the serious potential hazard to safety. The corporation is suing the Danish government to set aside the "Stop Fill" injunction in a legal action before the Danish Supreme Court and the Minister of the Interior.

The Danish Embassy in Washington, D.C., appealed to the U.S. State Department to obtain the services of two qualified individuals familiar with the storage, transportation and handling hazards of anhydrous ammonia. The State Department referred this request to the Health, Education and Welfare Department with instructions to do everything possible to assist the Danish Government. The Health, Education and Welfare Department contacted Mr. Chauncey Weisman, Senior Safety Engineer in the Pressure Vessel Section of the Division of Industrial Safety, as an individual, stating that his name had been included among many others to be submitted to the Danish Embassy which would make a final choice.

Mr. Weisman is a graduate of the University of Buffalo, with a B.S. in Mechanical Engineering. He also has a National Board of Boiler and Pressure Vessel certificate and a California Certificate of Competency to inspect boilers and pressure vessels.

On September 12, 1966, Mr. Weisman received a call from the Danish Embassy in Washington telling him that he and George Koth, Special Hazards Engineer, Factory Mutual Insurance Company, had been selected, and requesting him to arrange to be in Copenhagen in 15 days.

The two experts spent seven days there, making their evaluation. In brief their final report stated:

Location and Exposure

The anhydrous ammonia storage tank owned by A/S Ammonia is located on Vagervej in the harbor area of Esbjerg, on the west coast of Jutland, on the North Sea. Residential areas of the town are east of the harbor, starting approximately 400 meters from the tank site. The ground slopes upward east of the harbor. Prevailing winds are westerly about 45 percent of the time throughout the year. Mean temperatures vary from about 31.5°F (-3°C) in February to 62°F (16.7°C) in July.

Within 90 meters of the storage tank are three fish filet factories and a fish auction hall. A restaurant is located about 115 meters from the tank. Several hundred people could be in these buildings at a given time. Although the activity within the fish auction hall is essentially confined to a few hours in the early morning, the fish filet factories will generally be occupied throughout the better part of the day. At times, particularly during rough weather, fishermen may remain on their boats overnight. These boats would be moored 200 meters or more north of the storage tank.

The tank is erected on a site 30 m. by 52 m., about 3 m. from the property line on Vagervej. Ground slope is about 2 percent from Vagervej toward the harbor. The Coast Lighting Authority has erected a one-story building with wood walls and roof approximately 4½ m. west of the tank. This building provides serious fire exposure to the ammonia storage tank.

Storage Tank

The tank is an uninsulated, refrigerated, spherical container and has an internal diameter of approximately 21.6 m., providing a volume of about 5280 cubic meters. It is designed and constructed in accordance with current European standards. The annular foundation is of reinforced concrete, about 10 m. in diameter. The design working pressure is 99.6 psig (7 atm) (vapor pressure of ammonia at 17°C). All automatic hydraulic safety shutoff valves are located externally. Valves fail-safe (close) if hydraulic pressure is lost.

An x-ray inspection was made of all plate joints and all nozzle welds have been inspected by magnetic flux or ultrasound. A satisfactory pressure test has been made with the tank completely filled with water at about 130 psig (8.8 atm). At the Danish permissible filling density of 37.7 percent by weight, the sphere will hold 3364 tons (3052 Danish tons).

The four safety relief valves are arranged so that only one valve can be out of service at one time. Three valves will provide more discharge at 113 psig (7.7 atm) than required by ASA Standard K61.1-1966.



Close-up view of anhydrous ammonia storage sphere the contents of which could be a safety threat

Operation

This installation is intended for use as a storage and distribution facility for anhydrous ammonia. The liquid ammonia would be delivered by ship, which would dock at the pier to the southeast, and unload through above-ground piping to the storage tank. Transfer would be by pumping from newer ships, and by vapor pressure from older ships not equipped with pumping facilities.

Maximum storage would be during the late winter and early spring, up until the short period of a few weeks during which the ammonia is applied to the soil. The greatest activity in filling tank trucks or cylinders would be during the application season, although, since the Port of Esbjerg is ice-free, the loading of tank trucks might be carried on throughout the winter for transfer of ammonia to storage locations on ice-bound harbors.

Some liquid ammonia would be retained in the tank throughout the year.

Conclusions

One of the principal inherent hazards, without consideration of the storage tank per se, is the unloading of ammonia from ships and the filling of tank trucks. These operations are accomplished through temporary connections, and safety can only be achieved through competent, adequately instructed personnel.

The location of this tank with inadequate distances to property lines, serious exposure by fire, and lack of internal safety shut-off valves, precludes any recommended improvements that will infallibly insure against the occurrence of a serious accident under any or all conceivable sets of conditions. However, the following recommendations are offered to improve the safety of the existing facility, and if strictly adhered to, the hazard should be minimized and the probability of a serious release of an ammonia cloud will be considerably reduced.

Recommendations

1. Provide a reinforced concrete dike, 1.5 meters high, along the west, north, and east property lines. The south end of the dike along the east property line may be omitted for a sufficient distance to provide access for trucks to the property. Due to the proximity of the tank to the north and west property lines, this dike would not insure confinement for a very major spill, but would be beneficial for many conceivable accidents.

2. An automatic water spray system should be provided to protect the tank from possible fire exposure. This system should be designed so that the entire exterior surface of the sphere will be wet with water applied at a density of 0.204 lit/sec/sq. meter.

3. Automatic shut-off valves of the internal type should be provided on all pipe connections to the tank (located inside of the shell line of the sphere).

4. The tank should be covered with reflective white paint to reduce the absorption of heat from the sun.

5. Loading and unloading connections should be secured to a concrete bulkhead or equivalent, designed to withstand a horizontal load of a minimum of 2000 lb. (900 kg) in any direction (at both tanker and truck connections).

6. Operation

- a. Post a set of typed operating instructions, including emergency procedures, in a prominent location. Check employees frequently to be sure that they are familiar with these instructions and procedures.

- b. Complete protective clothing and self-contained breathing equipment should be provided and kept in an easily accessible location (not under lock).

- c. Two employees wearing full safety equipment should be present at truck loading operations, in sight of each other at all times, with one always within reach of the manual shut-off control.

- d. Unloading piping on the tanker shall have a remotely controlled shut-off valve or valves that can be actuated from a safe distance away from the hose and hose connections to stop the flow in the event of a leak or hose failure.

- e. All transfer hose and hose fittings should be at least 1250 psig bursting pressure rated, and tested at least annually at 200 psig for leakage.

- f. During the period of maximum activity (probably February 15 to May 15) when the storage vessel is frequently loaded or unloaded, a pressure of not greater than 70 psig (4.8 atm) should be maintained (vapor pressure at 7.2°C).

Over

g. Filling should not be done so rapidly as to form frost on the outside surfaces of the tank. If frost appears, filling should be stopped and not resumed until frost disappears.

h. During transfer into a transportation vehicle, the vehicle brakes shall be set and the rear wheels effectively blocked with chock blocks or equivalent.

i. Extinguishers suitable for fighting fires in electrical equipment should be provided.

j. An adequate supply of water should be available through hose to flush away and absorb small spills. Spray type nozzles are preferred.

7. General

a. The sphere should be marked "Caution—Ammonia" in large letters, readily visible from any direction.

b. Provide an audible alarm (Klaxon horn or gong) that will sound continuously until shut off, when ammonia is spilled or an emergency occurs, to warn others in the vicinity.

c. Employees in the fish filet factories should be instructed to use exits to Auktionsgade when warned of an ammonia release or when a release may be imminent.

d. Unloading of tankers or filling of tank trucks should be discontinued during periods when the fish auction is being held in the auction hall.

The California Safety News is mailed free of charge to those interested in industrial safety

Our Thanks to the DLS&R

As always, no summary of the annual Conference would be complete without mention of the valuable statistical information provided by the Division of Labor Statistics and Research—not only at the two-day meeting, but to Conference Sections throughout the year.

Pressure Vessel Section Discusses Nuclear Vessel Laws With Japanese

Standards of inspection of nuclear vessels in California were outlined recently by the Pressure Vessel Section in San Francisco for a team of Japanese atomic engineers.

They came with prepared questions that were answered by Arthur I. Snyder, Supervising Engineer; Mel S. Perlee and Joseph Olisiak, Senior Engineers; and William W. Steffan, Senior Health Physicist, Environmental Engineering Unit.

The Japanese team showed interest in state and federal governments' authority and responsibility with regard to siting, environmental monitoring, standards of construction and routine inspection, accidental releases of by-product material, and licensing and use permits for nuclear reactors.

How users of nuclear power can comply with regulations and provide proper maintenance to counteract corrosion, cracks and other failings also was discussed.

The visit was arranged through the Tokyo Electric Power Company. Members of the team were Noboyoshi Matsubara of Mitsui & Company, San Francisco office; Harumi Masuno, tour manager of Tokyo; Hideo Tokizawa of the Japanese government Atomic Energy Bureau, Science and Technology Agency; Jazaburo Terada, consultant, Tokyo Electric Power Company; and Mazutoshi Nakagawa of the Nuclear Power Section, Public Utilities Bureau, Ministry of International Trade and Industry.

* * *

Offices of the Division of Industrial Safety

The following is a list of main and field offices of the DIS.

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Ukiah	135 West Gobbi St.	462-8850
Ventura	3418 Loma Vista Road	642-9679



Thrust Velocity of Oxygen Versus Helium

By L. W. BALLINGER

Senior Engineer, Division of Industrial Safety

Assumption

1. Assume the gases to be escaping from a $\frac{3}{8}$ " diam. convergent exit passage from each cylinder into atmos.
2. Assume compressible flow and that both are perfect gases.
3. Assume isentropic expansion (reversible adiabatic).

Table I

Conditions and Constants Used	Oxygen Cylinder	Helium Cylinder
Press in Cylinders.....	2300 psi	2300 psi
Temp. in Cylinders.....	70° F	70° F
Universal Gas Constant.....	48.3	386
Ratio of Specific Heats.....	1.4	1.67
Atmos. Press.....	14.7 psi	14.7
Diam. of exit passages.....	$\frac{3}{8}$ "	$\frac{3}{8}$ "

Table II

	Oxygen	Helium
Exit Velocity.....	955 ft/sec	2920 ft/sec
Mass Rate of Flow.....	6.1 #/sec	2.48 #/sec
Thrust.....	179 #'s	230 #'s

Recently a company took issue with the Division regarding the securing of compressed helium cylinders. Several reasons were given for securing the cylinders, among them the argument that a cylinder might topple over and break off the fill fitting. The jet action produced by the escaping gas then might cause the cylinder to take off like a missile. The company agreed that this was possible for several of the compressed gases, but stated it could not occur with helium because of its low density. At first this seemed plausible as helium is eight times as light as oxygen.

Comparison of Gases

The Division decided to explore this argument further. For comparison purposes it was decided to compare the initial thrust produced by oxygen and helium escaping from the same diameter hole from cylinders at the same conditions of temperature, pressure, etc. The conditions are shown in Figure I and Table I. Also listed are the assumptions used in the necessary calculations. Table II lists the results of the calculations for the determination of exit velocity, mass rate of flow and thrust for the two gases in question.

Summation

In summary, the two gases being considered will escape from their particular cylinders at definite velocities, these velocities being their acoustical velocities. Although the oxygen is eight times heavier than the helium and its mass rate of flow is about 2.4 times greater, its exit velocity is about 3 times less.

From the above, it follows that the thrust produced by the helium is approximately 1.3 greater than that of the O₂. Needless to say, the argument that the heavier gas will produce the greater thrust is not valid.



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Mechanical Harvesting of Tomatoes

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Ernest B. Webb

Director, Department of Industrial Relations

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Cover photo courtesy of Farm Labor Service
State Department of Employment

HISTORICAL BACKGROUND OF INDUSTRIAL SAFETY CONFERENCE

The first meeting of what is now known as the Industrial Safety Conference was called by then Governor Earl Warren on October 13, 1949.

He gave the theme for the activities of the safety conference sections when he stated that, "We must have a public awareness of the problem, the knowledge to cope with it, and a determination to solve it. Nothing else will suffice."

Through the years following, labor and management representatives have adhered unswervingly to this advice. It is because of this one-mindedness of purpose that the Industrial Safety Conference has remained outstanding, nationwide.

Conference Objectives

Broad general principles were outlined as the objectives of the Conference at the first meeting.

The first and major objective is to reduce occupational injuries in California.

Another objective is to study the accident-prevention problems of this state through action committees, which will recommend the best methods of effectively stimulating active and continuing programs in each phase of industry.

The third objective is to develop a permanent organization and a continuing program for one specific purpose—progressively controlling California's industrial accident problem.

It was believed that to have just a one-year plan and no follow-through would have little value. A continuing campaign with revisions to meet changing conditions would provide California with a dynamic, effectual conference through the years.

Labor-Management Cooperation

History has borne out the wisdom of the safety theme and objectives laid down at that first meeting. For sixteen years labor and management have worked in complete harmony in attacking their mutual safety problems.

This year's conference will be one more advancing step in the attempt to bring the accident-injury problem under control.

You Asked for It!



Geo. A. Sherman
Division of Industrial Safety

The following are questions most frequently asked about the Division of Industrial Safety, its work, and the Safety Orders that it administers.

If you have any questions concerning the Division or industrial safety orders, write the Division of Industrial Safety, and we will try to answer them.

Q. I am a farmer, and have heard that your Division inspects farm operations. Does the Division enforce Safety Orders on farms, and how does it enforce them?

A. The Division is charged with enforcing State Safety Orders for all employments, except household domestics, maritime workers on board ship, federal employees, and operating employees of interstate railroads.

With its limited staff, and the some 400,000 places of employment (including farms) in California, it is not possible to inspect all places of employment as frequently as is desirable. For this reason the Division often concentrates the efforts of its safety engineers on areas or industries that particularly need them.

Safety Orders must be observed on the farm as they must be observed anywhere else. When a Division engineer points out violations, he explains how they can be corrected, and they must be corrected. You are given a reasonable time to make these corrections—the time usually depending on the degree of hazard.

Q. Why are California's Elevator Safety Orders so much more severe than those of other states?

A. Whether they are "more severe" is open to discussion; but it is pretty generally agreed that they are superior.

California's elevator coverage is more complete than that of any other state, and that completeness is paying off.

California is the only state, for instance, that requires approved contact locks on old as well as new freight elevator hoistway landing gates. Before this was required in 1947, there were as many as 13 or 14 elevator deaths a year in California, mostly from opening a gate when the car was not at the landing and falling down the hoistway.

In the last 17 years, 1949 through 1966, there have been only two deaths from this cause. In both cases the contact portion of the lock had been altered.

Q. Why do you pick on me? Why do I have to provide guards on my machinery when my competitor operates without guards?

A. First of all, the Division is not picking on you. It is the Division's responsibility to check every place of employment in California, but with the Division's limited personnel and limited budget it is not possible to check every place of employment every year. Remember, there are some 400,000 places of employment (including farms) in California, and it is not humanly possible to check more than a fraction of them in any one year.

Each of our field engineers has a definite territory to cover within a certain period, and he covers it from one end to the other, but it takes time. If your plant is inspected, you can be sure that other similar plants will be checked before long.

Checking for safety in places of employment is a matter of planned routine except for accident investigations and specific complaints, which are given the highest priority.

Q. If a company safety engineer and a Division engineer disagree over the interpretation of a Safety Order, what is the recommended procedure toward a solution?

A. A Division engineer's requirements are always confirmed by a letter from his supervising engineer. When the employer receives this confirmation he can, if he still thinks that his installation meets standards set by Safety Orders, reply at once and say why he disagrees.

No employer should hesitate to express his point of view at any stage of the discussions—in fact he is encouraged to do so if there is a difference of opinion.

The Division always strives to be consistently fair; but if conflicting opinions cannot be resolved, the Division's views must of course be observed.

Q. How can we as employers make better use of the DIVISION OF INDUSTRIAL SAFETY? Can we really feel free to call for help on a safety problem without fearing the policing power of the state?

A. An employer should never hesitate to call on the Division for advice as to the best method of protecting a piece of equipment or process, particularly at the time any new installations or changes in installations are contemplated.

It is better to do this before installations or changes are made, if there is any doubt whatever, as this will avoid expensive alteration later if they conflict with safety standards.

A Division engineer would review the equipment and process sooner or later, in any case, to check that all employments and the place of employment are safe—as the State Constitution and Labor Code require—and violations must of course be corrected. If that is considered "policing power," it is something that the California Legislature has long recognized as needed, and is in fact something the Legislature demands.

Safely Harvesting Tomatoes in California by Machine

By WILLARD L. PIPPITT, Safety Engineer,
Division of Industrial Safety



California tomato growers harvested over three million tons of processing tomatoes from 156,000 acres in 1966, according to reliable reporting services. This was almost two thirds of the total tonnage grown in the United States.

Six California manufacturers had 784 machines in service this year to mechanically harvest about two-thirds of this state's acreage. In order to make the mechanical picking economical, a new strain of tomatoes has been developed so that most of the fruit ripens at one time.

Each mechanical harvester required an average of 20 sorters and back-up personnel to replace 50 hand pickers. In addition to the average 16 sorters on each harvester, there are fork lift operators, trailer-pull tractor drivers, and an experienced harvester operator.

How It Works

A mechanical tomato harvester cuts the vine at about ground level and conveys it with all of the tomatoes to the shaker which removes the fruit from the vine. The tomatoes are collected on belt conveyors which carry the fruit past sorters who manually remove and discard all except the ripe, perfect fruit. The vine is dropped onto the ground at the rear.

Another conveying mechanism deposits this saleable portion of the crop in bins which are carried on a bin-trailer which is towed by a tractor alongside the harvester. The full bins are towed to the slab where they are loaded onto trucks. Empty bins are then loaded onto the bin-trailer which is returned to the field.

Mechanical harvesting brings a new set of potential hazards. Although there are minor mechanical hazards to be guarded before the 1967 tomato harvest, the manufacturers of mechanical harvesters have cooperated with the DIVISION OF INDUSTRIAL SAFETY to design safety into their machines. Almost all growers have added safety and comfort features to their machines. These include sun shades, seats, and easier access to work stations.

Safety Guide Lines

In the field, DIVISION engineers set the following requirements:

- loading and unloading areas, called slabs, must be large enough to prevent crowding of the operations, and sprinkled to keep down dust;
- adequate access to work stations must be maintained;
- standard two-rail railings to prevent falls from work platforms;
- guarding of belt conveyor nip-point hazards;
- no riders permitted on tractor hitches, trailer tongues, or on the forks of fork lift trucks; and
- on fork lift trucks there must be a back guard or canopy guard to protect the operator from falling bins. The back guard must extend at least halfway up the rear of the highest bin of the load. Canopies must be provided where the load is lifted above the operator's head.

Recommended are: an extra seat, when the swamper also rides the fork lift; and a swivel seat on machines where the driver must look back over his shoulder to see the load level.

Operations at Slab

Traffic patterns and loading operations should be discussed with the grower or slab supervisor to provide a smooth flow of traffic to and from the slab, and on it. Backing a trailer toward the bin loading area while another trailer is being loaded with bins is hazardous.

A tractor should be left in neutral, with the brake set, until the last bin is in place on the trailer and the tail-gate is latched.



Mobile mechanical tomato harvester moving through field. Note that vines and fruit are conveyed together into machine.

When it is necessary for employees to ride to or from the harvester, they must sit inside on the bottom of a bin.

Employees are required to wait until all mobile equipment stops before mounting or dismounting.

Seasickness

Since riding on the harvester causes some employees to become seasick, it is suggested there be carried a standard remedy for the prevention and relief of seasickness. Many growers provide this type of remedy and keep it in their first-aid kit. Rest periods at the end of each row can reduce the incidence of motion sickness.

Mechanization Will Increase

Experiments are being conducted whereby an entire crop can be harvested by a machine with one operator, and brought to a central sorting shed. Protected from the weather and without the ship-like roll of the harvester, fewer sorters will be needed and will do a better job, with greater safety. Hydraulic motors will replace mechanical power transmission equipment. This elimination of shafting, belt and pulley drives, chain and sprocket drives, and accompanying guards, will remove the source of many injuries.

It is estimated by Robert Holt, secretary-manager of the California Tomato Growers in Stockton, that when the processing tomato industry is fully mechanized, the growers will be hiring three times as many domestic workers as they did in the past years.

Industrial Training

With industrial-type jobs becoming more available on farms, industrial techniques on injury prevention are being used.

New workers are trained and former workers retrained by job instructions and safety indoctrination using films and other audio-visual aids.

With constant inspection of farms by its field engineers, plus the investigation of reported injuries, the DIVISION OF INDUSTRIAL SAFETY will be a big factor in controlling the accident frequency in mechanized agriculture.



Women working on the sorting belt using safety railing as a back rest. Note the sun shields overhead. Courtesy of Farm Labor Service, State Department of Employment

NINE-MONTH BOX SCORE Disabling Work Injuries and Deaths in California

Month	Disabling Work Injuries ^a			Deaths		
	1966	1965	1964	1966	1965	1964
January	16,448	14,403	14,534	65	73	63
February	13,601	14,156	13,911	55	42	60
March	16,073	15,860	16,066	59	48	56
April	15,115	14,025	15,514	73	51	62
May	17,560	15,315	14,944	65	62	56
June	16,117	14,965	15,023	53	64	64
July	17,469	14,931	16,847	52	74	50
August	18,044	16,987	16,347	68	63	64
September	17,459	16,130	16,065	53	71	60
9-month total	147,886	136,772	139,251	543	548	535

Injuries up 8.1% from 1965
Employment up 4.7% from 1965

^a Disability causing absence from work for a full day or shift beyond the day of the injury.

(Source: Division of Labor Statistics and Research)

Compensation Denied

When a worker was injured in an auto accident on his way to work, he filed for workmen's compensation benefits.

The company paid workers a 60-cent daily allowance under the union contract, but didn't exercise control over the means of transportation employees chose. The carfare allowance, the claimant contended, indicated that he was in the course of employment while on the way to work.

The company contested the claim and when the Industrial Accident Commission granted benefits, the company appealed the decision.

The California Court of Appeal (Westinghouse Electric Corp. v. Industrial Accident Commission) annulled the order. It ruled that in the absence of an express agreement between the employee and the employer, the employment relationship should not continue during travel to and from work. There was no evidence to support a finding that the injuries arose out of and in the course of employment. Benefits denied.

—October 1966 issue *Occupational Hazards*

Offices of the Division of Industrial Safety

The following is a list of main and field offices of the DIS.

MAIN OFFICES

SAN FRANCISCO.....	455 Golden Gate Ave.....	557-1946
Los Angeles.....	3460 Wilshire Blvd.....	381-5695

OTHER OFFICES

Bakersfield.....	225 Chester Ave.....	324-6437
Chico.....	341 Broadway.....	343-5182
Eureka.....	619 Second St.....	442-5748
Fresno.....	2550 Mariposa St.....	268-7151
Long Beach.....	230 East 4th St.....	432-8443
Merced.....	550 W. 22nd St.....	723-4561
Oakland.....	1111 Jackson St.....	834-3460
Redding.....	2115 Akard Ave.....	241-5100
Sacramento.....	1107 Ninth St.....	445-5818
Salinas.....	307 Soledad.....	424-4807
San Bernardino.....	478 West Base Line.....	884-6461
San Diego.....	1350 Front St.....	232-4361
San Jose.....	888 North First St.....	294-1525
Santa Ana.....	1619 W. 17th St.....	547-1603
Santa Barbara.....	411 E. Canon Perdido.....	966-2918
Santa Rosa.....	750 Mendocino Ave.....	542-8802
Stockton.....	31 E. Channel St.....	466-3547
Ukiah.....	135 West Gobbi St.....	462-8850
Ventura.....	3418 Loma Vista Road.....	642-9679

Two Engineers Retire

Two safety veterans of the Division of Industrial Safety retired the latter part of 1966.

Kyle Lutz, Mining Safety Engineer, entered State service in August 1941. He was a graduate of M.I.T. and worked for the Union Oil Company and the U. S. Bureau of Mines before joining the Division.

Clyde Satterfield, Construction Safety Engineer, came with the Division in January 1944. He had vast experience in the coal mines and was also with the U. S. Bureau of Mines.

Both men were veterans of World War I.

If You Move—

If you move, and wish to continue receiving the CSN, please notify us of your new address.

CERTIFIED BOILER ELEVATOR INSPECTORS MEET IN LOS ANGELES JANUARY 24-25-26

The California Certified Boiler and Elevator Inspectors Association will hold its fortieth annual convention January 24, 25, 26, 1967 in the Biltmore Hotel in Los Angeles. The conference is held under the auspices of the Department of Industrial Relations, Division of Industrial Safety.

New facets in the horizontal and vertical movement of people will be featured in the Elevator portion of the three-day program.

Highlights will include: "Speed Walks and Speed Ramps Including Commentary on Airride Design"—"Modern Trends in Elevator Fabrication"—"Hoisting Ropes in the High Rise Era"—and "Aerial Passenger Tramways and Portable Sky Rides."

Boiler and Pressure Vessel engineers

will hear experts discuss: "Safety for Nuclear Reactors"—"Total Energy Systems"—"Pressure Vessel Controls, Safety Devices, Test and Inspection (Boiler and Chilled Water Systems)"—and "Anhydrous Ammonia Systems."

An added outstanding feature of the conference will be an address by A. C. Blackman, Managing Director of the American Society of Safety Engineers.

Further details and information on the conference may be obtained from M. S. Perlee and J. Olesiak, 455 Golden Gate Avenue, Room 7239, San Francisco (telephone 557-0437); or from David Marten, The Continental Insurance Company, 1520 Wilshire Boulevard, Los Angeles (telephone 483-1700).

Industrial Safety Conference—Los Angeles, February 2-3

Labor and top-level management will meet at the 17th annual state-wide Industrial Safety Conference in the Biltmore Hotel, Los Angeles, on Thursday and Friday, February 2 and 3.

Some 1400 to 1500 persons are expected to be present at the two-day meeting.

The purpose of the Conference is to enable labor and management to exchange information and present new ideas on safety problems. The Conference has gained a reputation for outstanding contributions in the field of accident prevention.

The Conference program will be along the lines of those in the last few years—a format that has been extremely well received.

Registration will begin at 7:30 a.m. February 2nd in the Main Galeria of the Biltmore.

The feature of the general assembly will be two major addresses—one by a speaker from labor, the other by a speaker from management.

Section Programs

The eight major industry-groupings that make up the Conference will hold separate section meetings on the afternoon of February 2 and the morning of February 3.

The various sections are preparing excellent programs for the Conference, on a par with the highly informative and stimulating programs of recent years,

The programs, as far as they were arranged at the time of going to press, appear on the following page.

Program Highlights

Featured in the Agricultural Section program will be a discussion on medical emergencies in rural areas. This subject is of great concern to and is under intensive survey by the California Medical Association. The problem of new mechanized farm equipment crowding rural roads will also be presented.

A clever safety quiz for the audience, testing their industrial safety quotient, will be one of the features of the Manufacturing Section.

With the high accident rate in the construction trades always a problem the Construction Section will offer two speakers presenting labor's role and responsibilities in injury prevention and accident reduction.

New Federal Publication

"*Safety in Your Future*," a new 24-page booklet prepared jointly by the U. S. Department of Labor and the U. S. Department of Health, Education, and Welfare, describes the essentials of safe work habits and attitudes for young workers.

Designed to reach youngsters in school shops and labs as well as on first jobs, the booklet includes such important safety topics as use of portable power tools, machine operations, personal protective equipment, hazards of horseplay, and first aid.

The wrap-up is a 50-question quiz, *What Do You Know About Safe Practices and Accident Prevention?*

Educational Publications

The usual colorful exhibit will be displayed at the Conference, and will feature publications of the Division of Industrial Safety and the Division of Labor Statistics and Research.

Special Message Center

Pacific Telephone will install a message center booth for the convenience of those at the Conference, with attendants on duty from 9 a.m. to 5 p.m. on February 2, and 9 a.m. to 3 p.m. on February 3.

They will post the names of those receiving messages, and provide change for nearby coin telephones.

The message center booth phone number will be (Area Code 213-629-6416).

Hotel Reservations

The Biltmore Hotel has reserved a block of rooms for Conference use.

Those planning to stay at the Biltmore are advised to make reservations with the hotel direct, without delay, stating they will be attending the Conference.

In Memoriam—Inman S. Reid

Inman S. Reid, former Construction District Safety Engineer, Los Angeles, died recently after several heart attacks. He retired from State service in February 1965.

Mr. Reid joined the Division in 1941 and was promoted to District Engineer in 1962.

Prior to civil service, he was a safety inspector for the Water District of Southern California on the Colorado River Aqueduct project; a safety engineer for the Works Progress Administration; and an engineer for the Phelps Dodge Corporation.

He was born in 1901 at Hartwell, Georgia, and was a graduate in mining engineering of the University of Georgia. He resided in Pasadena.

In Memoriam—William J. Hobba

William J. Hobba, Petroleum Safety Engineer, Bakersfield, died November 21, 1966, of a heart attack.

Mr. Hobba joined the Division in 1942 in Los Angeles and was transferred to the Bakersfield office in 1957.

While employed by the Division in Los Angeles, Mr. Hobba also served as mayor of Signal Hill.

Prior to entering civil service he was employed by the Hancock Oil Company in various capacities.

He was born in Jacksonville, California, on November 7, 1902.

CONFERENCE

AGRICULTURE SECTION

THURSDAY AFTERNOON

- How to Develop and Maintain a Good Labor Force*—
How We Made Our Training Aids at Calpak—Demonstration—
 A. J. Ford, Manager of Agricultural Employment, and Robert
 R. Douglas, Training and Safety Manager, California Packing
 Corporation
How We Use Training Aids at Coastal Growers' Association—
 Demonstration—William V. Lloyd, Jr., Manager, Coastal
 Growers' Association, Inc., Oxnard
Can You Afford to Lose a Trained Man?—Floyd McCall, Super-
 visor, Fourth District, County of Riverside, and Agriculture
 Engineer
Farm Management Problems Round Table—Panel discussion Mod-
 erator: Ralph R. Parks, Education Director, Agriculture Engi-
 neering, University of California, Davis

FRIDAY MORNING

- Medical Emergencies in Rural Areas*—L. J. Snyder, M.D., Chair-
 man Rural Health Committee, California Medical Association,
 Fresno
Handling Anhydrous Ammonia—Robert H. Moody, Assistant
 Regional Operations Manager, Ortho Division, Chevron Chem-
 ical Company, Whittier
Road Use by Heavy Equipment—a construction industry safety
 engineer
*How Much Longer Will Farm Equipment Be Able to Use Our
 Roads?*—Captain D. R. McDaniel, Administrative Assistant, Cali-
 fornia Highway Patrol, Sacramento

CONSTRUCTION SECTION

THURSDAY AFTERNOON

- Safety in Tunnel Construction*—Edward P. Searby, Safety Direc-
 tor, J. F. Shea Company, Inc.
Construction Injury Trends—Maurice I. Gershenson, Chief, Divi-
 sion of Labor Statistics and Research
Labor's Role in Safety—John A. Cinquemani, Executive Secretary,
 Los Angeles Building and Construction Trades Council
Where Are We Heading Safety-wise?—

FRIDAY MORNING

- Labor's Responsibilities in the Safety Program*—Anthony Ramos,
 Executive Secretary, State Council of Carpenters
So You're For Safety—Jacob Gold, Safety Engineer, Bureau of
 Labor Standards, U. S. Department of Labor

FOREST PRODUCTS SECTION

THURSDAY AFTERNOON

- Pre-placement Physicals*—Carl E. Nemethi, M.D., Industrial Med-
 ical and Surgical Clinic, L.A.
Workmen's Compensation Trends—S. J. Hillman, Regional Man-
 ager, State Compensation Insurance Fund, Los Angeles

FRIDAY MORNING

- Are Your Employees Indoctrinating You?*—A. M. Smith, Safety
 Consultant, A. M. Smith and Associates, Los Angeles
How To Save Money Through Accident Investigations—John C.
 Mader, Safety Consultant, Employers Mutuals, Wausau, Wis-
 consin

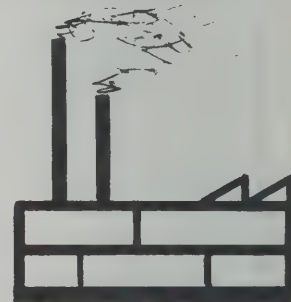
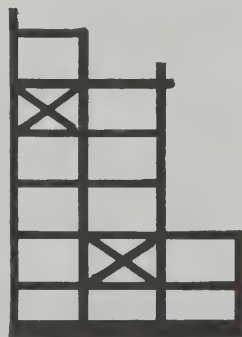
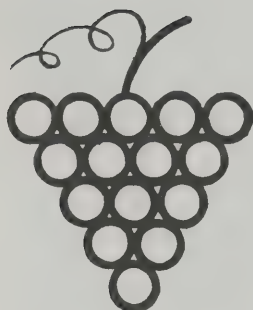
GOVERNMENTAL AGENCIES SECTION

THURSDAY

- Industrial Psychology*—Dr. H.
Work Area Protection—a pan-
 Steve Starr, Safety Engineer
 Public Works
 Gerald A. Wyss, Engineer
 sion, Los Angeles Water a

FRIDAY

- Firemen Protect Us—Workm*
 —George Sanders, District
 ance Fund, Los Angeles
Modern Technology in the F
 Chief, El Monte Fire Depart



THURSDAY

- The Real Cause of Accident*
 Lockheed Aircraft Corpora
How to Motivate People to
 brook, Chief Psychiatrist a

FRIDAY

- The Role the Industrial Nu*
 R.N., Atlantic Research Cc
I.S.Q.—What Is Your Indu.
 Rhodes, Supervisor of Hea
 Livermore
Unusual Accidents—Robert
 Engineer, Hunts Food Corp

E PROGRAM



AFTERNOON

on M. Moody, Psychologist
 scussion,
 os Angeles City Department of
 Charge, Water Operating Divi-
 ower

MORNING

Compensation Protects Firemen
 ager, State Compensation Insur-
 ervices—Bob Madden, Battalion
 t

MANUFACTURING SECTION

AFTERNOON

ck F. Hatton, Safety Director,
 Los Angeles
 rk Safety—Dr. Edward Stain-
 iversity of Southern California

MORNING

ays in Safety—Betty Colucci,
 tion
 Safety Quotient?—Gilbert L.
 nd Safety, Sandia Corporation,
 Pete" Miller, Regional Safety
 on, Hayward

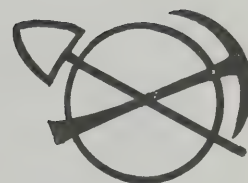
MINERAL INDUSTRIES SECTION

THURSDAY AFTERNOON

Mineral Industries Current Accident Statistics—Maurice I. Ger-
 shenson, Chief of Division of Labor Statistics and Research
Federal Mining Legislation Public Law No. 89577—Robert Signer,
 Supervising Engineer, Division of Industrial Safety

FRIDAY MORNING

*THUMS Long Beach Company's Development of East Wilming-
 ton Oil Field*—J. S. Russell, President and General Manager,
 THUMS
Labor's Responsibility Toward a Safety Program—speaker to be
 announced later
Safety Program of Rock and Sand Quarry Industries—Don Rein-
 ing, Executive Secretary, Southern California Rock Products and
 Southern California Ready Mix Association



TRADES AND SERVICE SECTION

THURSDAY AFTERNOON

Restaurant Safety—Basic and Practical Safety Programs—a panel
 discussion—Dwight Anderson, Knotts Berry Farm; Hans Ewald,
 Clifton Cafeterias; Arthur Wynne, Lawrence L. Franks Enter-
 prises; Robert M. Riley, Southern California & California State
 Restaurant Association

FRIDAY MORNING

*How to Safety-Survey for Accident Prevention in Your Opera-
 tion*—Charles A. Kleinwachter, Area Supervising Safety Engi-
 neer, California State Compensation Insurance Fund, Sacra-
 mento
*Workmen's Compensation Insurance Program Under Today's
 Regulations*—Gordon R. Stark, Supervising District Representa-
 tive, California State Compensation Insurance Fund, Los
 Angeles

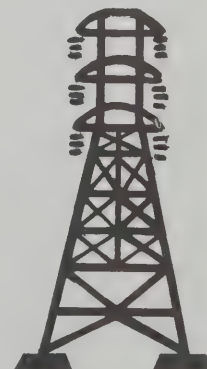
TRANSPORTATION-COMMUNICATION-UTILITIES SECTION

THURSDAY AFTERNOON

Report on TCU Activities
How's and Why's of Rate Making—a panel discussion and demon-
 stration by State Compensation Insurance Fund
*How Does Top Management Really Know What's Happening
 Way Down Below?*—speaker to be announced later
School Bus Transportation Problems—a panel discussion of experts
 from California Highway Patrol

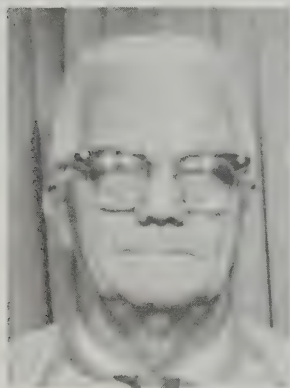
FRIDAY MORNING

Safety Demonstration and Display—Pacific Telephone & Tele-
 graph Company
*Workmen's Compensation—Changes in Laws and Reorganization
 of the Workmen's Compensation Appeals Board*—Miss Frances
 Chargin—Referee, Workmen's Compensation Board, Los
 Angeles
Open Forum



Chlorine in Public and Semi-Public Buildings and Industrial Locations

By CHARLES E. FARRELL, Safety Engineer,
Division of Industrial Safety



Chlorine is one of the standard agents for disinfecting swimming pool water.

The use of liquid chlorine for this purpose should be recognized as potentially hazardous. Indoor swimming pools are usually located below ground level where, in the event of a chlorine leak, access to the chlorine cylinders and chlorinating equipment may be difficult.

It is recommended that special safety precautions be provided where liquid chlorine must be stored or used in public and semi-public buildings and industry.

Emergencies

In an emergency, telephone the chlorine manufacturer whose name appears on the container. The name and address of the manufacturer and/or nearest chlorine producer should be posted in the office of the person in charge of chlorine handling, in the first-aid room, and in the office of the plant manager.

Emergency Breathing Apparatus

Canister gas masks of a type approved by the U. S. Bureau of Mines for chlorine service should always be readily available where chlorine is being stored or transported or used. Gas masks should be located outside the probable area of contamination so that it will be possible to reach them

in case of emergency. In addition, a replacement canister should be provided and a record shall be kept of gas mask usage to insure that the mask will be serviceable when needed.

Where chlorine is used over wide areas, masks should be available in several locations. Gas masks of the canister type do not supply oxygen; they absorb the chlorine present in the air leaving clean air to breathe. Where the chlorine content of the air is greater than 1 percent, a self-contained oxygen breathing apparatus, or a fresh air hose mask should be used. All personnel that may be required to use gas masks should be properly instructed and required to practice their application and use. The gas mask shall be kept in a closed cabinet accessible without a key, lo-

cated outside of the room in which the chlorinator is maintained.

Shipping of Cylinders

It is illegal to ship cylinders containing chlorine unless they are loaded by or with the consent of the owner of the cylinders. Never mix chlorine and another gas in the container. It is illegal to remove or change the numbers or marks stamped on the containers without written authority from the owner, and written notification to the Bureau of Explosives, 30 Vesey Street, New York 7, New York. It is illegal to ship a leaking container, whether full or partially full. It is illegal to ship chlorine in containers that have been exposed to fire. Consult your supplier for advice under these circumstances.



Testing for chlorine leak with ammonia-water; gas is leaking.

Safe Usage

The chlorine and chlorinating equipment shall be in a separate well-ventilated room. Such rooms shall not be below ground level and shall be provided with vents near the floor which terminate out-of-doors. The door of the room shall not open to a swimming pool, and wherever possible shall open to the outside. Use containers in the order in which they are received.

Never tamper with the safety devices on containers. Open container valves slowly. The use of large wrenches or pipe wrenches will damage the valves. One complete turn of the valve stem in a counterclockwise (left-hand) direction opens the valve sufficiently to permit maximum discharge. Do not use a wrench longer than 6 inches on a container valve. In making a connection to the valve outlet, clamps and adaptors are recommended. In case threaded connections are used, make sure that the threads on appliances and unions are the same as those on container valve outlets. Never force connections that do not fit. The outlet threads on the valves of containers are not tapered pipe threads. Containers or valves should never be altered or repaired by the consumer.

Gas Leaks

Gas leaks around the valve stem may usually be checked by tightening the packing nut. To test for chlorine leaks: attach a cloth to one end of a stick, soak the cloth with ammonia-water, and apply to the suspected area. A white cloud of ammonium chloride will result if there is any chlorine gas leakage. **IMPORTANT:** Never apply water to leaking chlorine. As soon as containers are empty, close their valves, disconnect, and test for chlorine leaks, as described in how to test for chlorine leaks above, at the valve outlets. If no leakage is indicated, promptly apply cap nuts to valve outlets, and attach valve protection hoods securely in their proper places. These fittings should always be kept in place except when the container is being emptied. The open end

of the line leading from the container should be plugged or capped immediately to keep moisture from entering the system. Return empty containers promptly. Use only reducing valves and gages designed for chlorine. Consult the chlorine producer for details. Never apply heat directly to any container.

Discharging Containers

Containers should be discharged in a room which has a temperature of about 70 degrees Fahrenheit. If the rate of gas evolution from a single container is not sufficient, consult your chlorine or chlorine equipment supplier for detailed information. Cylinders of 150 pounds capacity or less will deliver chlorine gas when unloaded in an upright position and will deliver liquid chlorine when unloaded in an inverted position. The ton containers in a horizontal position and with the valves in a vertical line will deliver liquid chlorine from the lower valve and chlorine gas from the upper valve. If chlorine is being absorbed in a liquid, there is a tendency for the liquid to suck back into the cylinder or container due to creation of a partial vacuum when the

cylinder or container becomes empty. This should be avoided as it has resulted in numerous accidents. Consult your chlorine or equipment supplier before proceeding with this operation. Always empty cylinders on a scale, in order to know at all times the amount of chlorine in the cylinder or ton container.

The chlorine equipment shall be of rugged design, capable of withstanding wear without developing leaks. Chlorine cylinders shall be anchored to prevent their falling over. Keys shall be maintained on the chlorine cylinder so the supply can be shut off quickly in the case of an emergency. The chlorine feeding device shall be designed so that during accidents or interruptions of the water supply, leaking chlorine gas will be conducted to the out-of-doors. The device shall be a solution feed type, capable of delivering chlorine at its maximum rate without releasing chlorine gas to the atmosphere. The chlorinators shall be designed to prevent the backflow of water into the chlorine solution container. A scale for determining weight of chlorine used shall be provided.



Head of chlorine cylinder shows small leak at fitting.

How and Where to Store

All containers should be stored in a cool place and protected against external heat sources. Never store containers near combustible or flammable materials. Chlorine containers should be segregated. Containers should not be stored where they are exposed to continuous dampness. Cylinders should be stored in an upright position. Ton containers should be stored on their sides on a level rack which may be constructed of I-beams or two railroad rails properly supported a few inches off the ground. Valve protection hoods on ton containers and cylinders should always be kept in place except when containers are being emptied. Do not hoist cylinders by the hood. Store full and empty containers in different places to avoid confusion in handling them. It is good practice to tag empties. Do not store containers near elevators or gangways or in locations where heavy objects may fall and strike them. The storage room should be well ventilated, and the containers so arranged that any container can be removed with a minimum of handling of other containers. Where practical, the storage room should be fireproof. Storage in sub-surface locations should be avoided. Containers stored out-of-doors should be protected against direct exposure to the sun and against accumulation of snow or other material that may build up around them. They should be kept clean and should be inspected regularly. Never store containers or place leaking containers where the fumes can enter a ventilating system.

First-Aid Measures

The following first-aid measures are recommended for persons exposed to chlorine:

a. Carry patient from gas area. Patient should preferably be kept in a warm room (about 70 degrees Fahrenheit). Supply blankets if necessary. Keep patient warm and quiet. Rest is essential.

b. Place patient on back with head and back elevated.

c. Call a physician *immediately*.

d. Splashes of liquid chlorine and chlorinated water destroy clothing, and if such clothing is next to the skin will provide irritation and acid burns. In such cases remove clothes. Flush exposed areas with water, if the condition of the patient permits it.

e. Oxygen administered under pressure is mandatory. This treatment should be continued as long as the patient shows any tendency to have paroxysm of coughing. Instructions of the purveyor of the gas apparatus should be carefully obeyed.

f. Milk may be given in mild cases as a relief from throat irritation.

g. If breathing has apparently ceased, start immediate artificial respiration by one of the following methods, listed in order of preference. Do not exceed a rate of 18 cycles per minute.

(1) Mouth-to-mouth method.

(2) Back - pressure arm - lift method.

(3) Prone pressure method. (Schafer)

h. Provide first aid as may have been prescribed for emergencies by your company physician pending his arrival.

THREE-YEAR BOX SCORE Disabling Work Injuries and Deaths^a in California

Month	Disabling Work Injuries			Deaths ^a		
	1964	1963	1962	1964	1963	1962
January	14,534	14,437	13,713	63	43	56
February	13,911	12,622	12,014	60	48	20
March	16,066	13,289	12,640	56	57	83
April	15,514	14,157	15,172	62	57	30
May	14,944	13,520	14,463	56	58	73
June	15,023	13,352	12,567	64	36	60
July	16,847	17,267	15,617	50	67	79
August	16,347	15,089	14,403	64	54	60
September	16,065	16,915	14,864	60	89	60
October	15,255	16,906	15,952	67	49	61
November	14,984	12,094	13,224	67	50	68
December	12,683	13,827	11,379	57	42	46
12-month total	182,173	173,475	166,008	726	650	696

Injuries up 5.0% from 1963
Employment up 3.5% from 1963

^a In January 1964, the definition of a "work fatality" for statistical purposes was revised to exclude all compromise and release settlements, except where the sole issue is dependency. Monthly fatality totals for 1962 and 1963 have been revised to conform to the new definition.

(Source: Division of Labor Statistics and Research)

Highlights of Revised Boiler and Fired Pressure Vessel Safety Orders

The revision of the Boiler and Fired Pressure Vessel Safety Orders has been completed. The Orders were adopted by the Industrial Safety Board on October 4, 1966, and have become effective on December 2, 1966. The last revision of these Safety Orders was in 1955.

The following is a brief summary of the most important changes. The scope of the Orders has been broadened to include nuclear boilers and high-temperature water boilers.

Revised Fee Schedule

The schedule of fees charged for inspections by the Division's engineers was also revised in response to a change in the Labor Code during the 1965 Legislative Session.

The fee schedule for inspection of boilers after December 2, 1966, follows:

Safety Order 777. *Shop Inspection Fees.*

- (a) Boilers and fired pressure vessels inspected in the fabricator's shop.....\$ 2.00 each or \$8.00 per hour whichever is greater, with a minimum charge of \$8.00 per visit.
- (b) Boilers and fired pressure vessels inspected at the jobsite during erection\$25.00 each or \$8.00 per hour whichever is greater, with a minimum charge of \$8.00 per visit.

Safety Order 777(c). Whenever a manufacturer or user of any apparatus or equipment fails to pay the fees required by this section within sixty days after notification, said manufacturer or user shall pay, in addition to the fees required by this section, a penalty fee equal to 100 percent of such fee. For the purposes of this section, the date of the invoice shall be considered the date of notification.

Safety Order 778. *Field Inspection Fees.*

- (a) Firetube boilers 30 inches in diameter or less
Internal inspection\$ 6.00 each
External inspection\$ 4.00 each
- (b) Firetube boilers exceeding 30 inches in diameter to and including 48 inches in diameter
Internal inspection\$10.00 each
External inspection\$ 6.00 each
- (c) Firetube boilers exceeding 48 inches in diameter
Internal inspection\$12.50 each
External inspection\$ 6.00 each
- (d) Watertube boilers not exceeding 150 square feet heating surface
Internal inspection\$ 6.00 each
External inspection\$ 4.00 each
- (e) Watertube boilers exceeding 150 square feet to and including 500 square feet
Internal inspection\$10.00 each
External inspection\$ 6.00 each
- (f) Watertube boilers exceeding 500 square feet to and including 2,500 square feet
Internal inspection\$12.50 each
External inspection\$ 6.00 each
- (g) Watertube boilers exceeding 2,500 square feet
Internal inspection\$25.00 each
External inspection\$ 8.00 each
- (h) Resale inspection of all boilers.....\$ 8.00 per hour
Minimum charge per boiler.....\$ 8.00 each

The fee schedule for tanks was also revised in the Unfired Orders at the same public hearings. The fees to be charged for the inspection of tanks after December 2, 1966, is:

Safety Order 460. *Shop and Resale Inspection Fees.*

- (1) Shop inspection of tanks of not more than 1,200 U. S. gallon water capacity:
One tank\$ 6.00
Lots of two or more tanks.....\$ 8.00 per hour or .70 per tank, whichever is the greater, with a minimum of \$8 per shop visit and with a maximum charge of \$64 per normal workday.
- (2) Shop inspection of tanks of more than 1,200 U. S. gallon water capacity\$ 8.00 per hour with a minimum of \$8 per tank.
- (3) Resale inspection of all tanks.....\$ 8.00 per hour with a minimum of \$8 per tank.

Safety Order 464. *Inspection Fees, Air Tanks.*

- (1) Tanks of not more than 1,200 U. S. gallon water capacity.....\$ 6.00 each
- (2) Tanks of more than 1,200 U. S. gallon water capacity.....\$ 6.00 each or \$8 per hour, whichever is the greater.

Safety Order 488. *Field Inspection Fees, L.P. Gas Tanks.*

- (1) Tanks less than 1,200 U. S. gallon water capacity\$ 6.00 each [except as permitted in subsection 488 (a) (3)]
- (2) Tanks larger than 1,200 U. S. gallon water capacity\$ 6.00 each or \$8 per hour whichever is the greater [except as permitted in subsection 488 (a) (3)]
- (3) Two or more tanks installed at the same location* and inspected on the same day for the same employer and such employer has requested or made prior arrangements for the inspection\$ 6.00 for the first tank plus \$1 for each additional tank with a minimum charge of \$8 per hour or \$8 per visit to the location* whichever is the greater.

* NOTE: Location as used in this Order shall be defined as any premise or premises under the control of a single employer and with such premise continuous except for roadways or other rights of way.

(c) Whenever a manufacturer or user of any apparatus or equipment fails to pay the fees required by this section within sixty days after notification, said manufacturer or user shall pay, in addition to the fees required by this section, a penalty fee equal to 100 percent of such fee. For the purpose of this section, the date of the invoice shall be considered the date of notification.

Revision of Pneumatic Loading Safety Orders (Blasting)

The revision of the Pneumatic Loading Safety Orders (Blasting) was adopted by the Industrial Safety Board June 14, 1966. They became effective August 18, 1966. The original Orders came into effect October, 1944.

The original Pneumatic Explosives Loading Safety Orders were adopted in the mid-forties to control the hazardous practice of using air pressure to load granulated explosives into bore holes. Previous to the adoption of the original Orders, there had been a number of fatalities attributed to pneumatic loading of explosives.

Since the late fifties there has been an ever-increasing change from the use of explosives in air loaders to the use of nitro-carbo-nitrates. In fact at this time there are very little, if any, explosives being used in air loaders.

Because of the lesser sensitivity of nitro-carbo-nitrates to detonation, higher air pressures are permitted as compared to explosives.

The revised Orders differentiate between the pressure-vessel-type air loader and the ejector-type air loader. The pressure vessel must be built in compliance with the Unfired Pressure Vessel Safety Orders.

The section on the control of static electricity and stray currents has been expanded. The use of static-dissipating loading hose is now required.

The revised Orders are printed below in their entirety.

ARTICLE 1. GENERAL

6900. Title. These Orders shall be known as the Pneumatic Loading Safety Orders (Blasting).

6901. Definition. (a) "Air Loader." A device for injecting an explosive or blasting agent into a bore hole or other cavity, using compressed air as the propulsive force. There are two basic types of air loaders; the pressure vessel system that forces the explosive or blasting agent through a loading hose, and the ejector system which operates on the venturi principle, in that the explosive or blasting agent is sucked out of an open container and carried into the bore hole by the air stream.

(b) "Air Supply Lines." Pipe, hose, or combination of pipe and hose, that supplies compressed air to the air loader.

(c) "Blasting Agent." Any material or mixture consisting of a fuel and oxidizer intended for blasting, not otherwise classified as an explosive and in which none of the ingredients are classified as an explosive provided that the material or mixture cannot be detonated by a number 8 blasting cap. (See Cap Sensitivity Test, Appendix A.)

(d) "Division." The Division of Industrial Safety.

(e) "Explosive." A mixture of chemical compounds which is capable of producing an explosion by its own energy. For purposes of these Orders, this includes black powder, dynamite, nitroglycerin, nitroglycerin compounds, nitro starch, fulminate, or any other substance having explosive power equal to or greater than black powder.

(f) "Loading Hose." The hose through which an explosive or blasting agent is blown or forced from the air loader to the loading tube.

(g) "Loading Line." The loading hose, loading tube and all fittings and connections from the air loader to the discharge end of the loading tube.

(h) "Loading Tube." The rigid or semi-rigid static dissipating tube or hose at the discharge end of the loading line, which is inserted into the bore hole while loading.

NOTE: The loading hose and loading tube may be constructed in one piece.

(i) "Nitro-carbo-nitrate." A blasting agent which is a mixture of a nitrate compound, such as ammonium nitrate, and carbonaceous materials. If the mixture can be detonated by a number 8 blasting cap, it must be treated as an explosive. (See Cap Sensitivity Test, Appendix A.)

(j) "Static Dissipating." Sufficiently conductive to dissipate charges of static electricity but possessing enough electrical resistance to be nonconductive to ordinary stray electrical currents. The electrical characteristics shall be uniform and for hose or tubes shall have a resistance of not less than 5,000 ohms per foot nor more than 30,000 ohms per foot.

6902. Construction of Air Loaders. (a) Nitro-carbo-nitrate shall not be loaded into any air loader constructed of copper, copper alloys, or zinc (including galvanized metals) unless the loader is constructed so that such incompatible materials do not come in contact with the nitro-carbo-nitrate.

(b) An explosive shall not be loaded into any air loader constructed wholly or in part of ferrous metals except that stainless steel may be used.

(c) The vessel that is pressurized on an air loader shall be designed, constructed, inspected, and stamped in compliance with the Unfired Pressure Vessel Safety Orders of the Division of Industrial Safety for a maximum allowable working pressure of at least 125 pounds per square inch.

6903. Air Loader Equipment. (a) A 20-mesh screen, an air trap or a filter shall be

installed in the air supply line adjacent to the loader when a pressure vessel is being used or when an explosive is being loaded.

(b) An air pressure reducing regulator of standard manufacture shall be installed in the air supply line and shall be a part of the loader assembly for a pressure-type loader.

(c) An air pressure relieving safety valve of adequate capacity shall be installed in the air supply line between the air pressure reducing regulator and the pressure vessel of the air loader. There shall be no valve between the pressure vessel and the pressure relieving device.

(d) An adequate pressure gauge shall be installed in the air supply line between the air pressure reducing regulator and the air loader pressure vessel.

6904. Air Temperature and Pressure. (a) The temperature of the air supplied to the air loader shall not exceed 150 degrees Fahrenheit.

(b) The air pressure shall not exceed 50 pounds per square inch when explosives are being loaded.

(c) The air pressure relieving safety valve shall be set to open at a pressure not to exceed 55 pounds per square inch, when an explosive is being loaded. When a blasting agent is being loaded, the safety valve shall be set at not more than 110% of the safe loading pressure, but in no case to exceed 110 psi.

6905. Control of Static Electricity and Stray Currents. (a) There shall be continuous electrical path from the discharge end of the loading tube, through the loading tube, the loading line, the air loader, and to ground. The loading tube shall be static dissipating and shall be at least two (2) feet longer than the deepest hole loaded. Generally, metal air loaders resting directly on the ground are sufficiently grounded. However, in non-conductive rock or earth, an auxiliary ground shall be provided by metal straps or cables of at least #8 American Wire Gauge connected to ground rods. If it is necessary, the ground rods shall be driven into water filled holes. The total resistance from the discharge end of the loading tube to ground shall not exceed two megohms.

(b) The loading tube and loading hose, if one piece, shall be either of a distinctive design or else identified at least every 18 inches that it is static dissipating.

(c) No loading operations shall be performed during the time an electrical storm is approaching or in progress.

6906. Operations and Procedures. (a) The air supply line shall be thoroughly blown out before it is attached to the air loader.

(b) All material poured into a pressure type air loader shall be passed through a screen having openings not larger than half an inch ($\frac{1}{2}$ ").

(c) Air loaders when used to blow or force stemming into loaded holes shall be thoroughly cleaned before and after such use.

They Needn't Have Died!

The following cases were taken from a file of injury reports.

The Accident and Death	The Unsafe Act	The Unsafe Condition	To Prevent Such Deaths
Two employees were in a tow truck that ran out of gas. One employee removed the air cleaner from the carburetor and poured gasoline into the carburetor barrel from a 5-gallon container. The gasoline spilled over the motor and employee. The other man tried to start the motor. It backfired and the gasoline burst into flames, engulfing the man with the can.	Pouring gasoline from an unwieldy container.	Unwieldy container.	Use only a very small amount of gasoline. A thimbleful is enough. Replace air filter. Close hood.
A welder was attempting to add extra pressure to an acetylene tank by pressurizing it from a full oxygen bottle. The acetylene tank exploded violently.	Pressuring an acetylene tank on the job.	Acetylene tank connected to oxygen tank.	Never mix gases in a cylinder.
After backing his truck against a loading dock and blocking the rear wheels, a truck driver found he was too close to be able to open the rear doors. He drove the truck forward 6 feet but forgot to move the rear wheel blocks. While he was at the rear of the truck it rolled back and crushed him.	Getting between the truck and dock.	Unblocked wheels.	Always check blocking under wheels before going between truck and dock.
A crane operator in a scrapyard crawled into the gear compartment while the gears were idling. His loose clothing caught in the open gears, and he was dismembered.	Working around open gears.	Unguarded gears; loose clothing.	Enclose all open gears, as is required by <i>General Industry Safety Order 3543</i> . Don't wear loose clothing around machinery. <i>General Industry Safety Order 3289b</i> .
Although not authorized to do so, a fork lift truck operator used an LP-Gas nozzle to blow dust from the radiator of his truck. When he started the motor, the truck and employee burst into flames.	Using LP-Gas to blow off radiator.	Gas nozzle available to unauthorized personnel.	Lock all nozzles against unauthorized use, and permit only designated employees to service trucks.
A coil winder working on a heater unit of 110 volts with exposed electric connectors, gripped the 110-volt contact while leaning against a metal vacuum chamber. He was electrocuted.	Handling exposed 110-volt contacts.	Proximity of a grounded surface.	Insulate all exposed electrical contacts, as required by <i>Electrical Safety Order 2309b</i> .
A tire repair man was inflating a truck tire that had been repaired. As he was bending over the tire, the lock ring flew off and struck him in the head, killing him.	Bending over the tire while inflating it. Not using safety cage.	Improperly seated lock ring.	Always use a safety cage that will contain flying objects and instruct workers how to use it. <i>General Industry Safety Order 3275</i> .
A hoof trimmer entered a large pen in order to hook a rope through the nosering of an untethered bull, instead of waiting until his helpers locked the bull in a stanchion. The bull gored him to death.	Entering a pen containing an untethered bull.	Loose bull.	Never enter a corral where there is a loose bull.
A farm laborer entered a grain bin by himself from the top, to break down the grain into a bottom chute. He slipped off the ladder and was suffocated by the loose grain.	Entering a grain bin alone.	Lack of a life line and safety belt.	Never enter a grain bin to poke down grain unless using a life line and safety belt, and having another person standing by.

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The menace of unshored excavations continues. Below is one of the unshored trenches mentioned on page 6.



Vol. 50, No. 3
September 1966

California Safety News

California Safety News

Vol. 50, No. 3, September 1966

The California Safety News is mailed free of charge to those interested in industrial safety.

State Perspective and Policy...

For any state to achieve significant progress in reducing the toll of industrial injury and death, the perspective and policy of that state must, in my opinion, include *three* fundamentals.

One is the enactment of enabling legislation that permits the state agency having jurisdiction over industrial safety to prepare safety regulations *without delay*, once it believes there is a need for them.

Another is the compilation, tabulation, and analysis of all disabling work injuries in that state.

The *third* is clear and unmistakable evidence that the governor and legislature of the state are firmly and fully committed to the policy of securing safety in places of employment.

I am happy to say that California has long recognized the importance of these three fundamentals and, what is more important, *observed* them. That recognition and observance have largely contributed to the decline in California's work injury rate last year to its lowest level in history. (31.3 injuries per 1,000 workers.)

Technological advances today are at an increasingly rapid and dizzy pace, far greater than was imagined even as little as thirty years ago. For this reason, it would be quite impossible for any legislature itself, in addition to its many other duties, to cope immediately with new hazards presented by new machines, new processes, and occasionally even new industries, as they are introduced.

The solution is enabling legislation that leaves control of such hazards to an effective state agency having competent, well-trained safety engineering personnel—men with not only a sound background in their field but whose full-time job is industrial safety.

Enabling legislation should be *general* in scope, and not confined to specific hazards or specific measures. It should give full authority to the safety agency concerned to prepare safety regulations as and when it deems them necessary. And those regulations should have the force and effect of law.

(continued on page 11)



In This Issue...

Because of their value, we include in this issue, which will be out at the end of October, two speeches given at the National Safety Congress in Chicago during the week of October 24th-28th.

Director Ernest B. Webb's address on *State Perspective and Policy* appears on this page.

Chief George A. Sherman's talk on *Electrical Work Injuries* is on the facing page.

A view of Highlights of the *Revised Compressed Air Safety Orders* is given on page 10.

A new look on *Protection of Workmen in Trenches* appears on page 6.

For a reprint of one of the most popular items ever appearing in the CALIFORNIA SAFETY NEWS—*An Alphabet of Industrial Safety*—turn to page 8.

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Electrical Work Injuries

By GEO. A. SHERMAN, Chief of the Division of Industrial Safety

One out of every 26 electrical work injuries, disabling and non-disabling, results in death, according to California figures for 1964.

By disabling injuries I mean those which prevent workers from returning to the job the next day.

In California industry as a whole that year, the rate was one death for roughly every 1,377 injuries, disabling and non-disabling.

In other words, *the ratio of death to electrical injuries is 53 times as high as the rate for industry generally*—certainly in California at least; and there is no reason to imagine that the national pattern is different.

One out of every 64 contacts with low voltage results in death. *One out of every seven contacts with high voltage is fatal.*

Here are a few other interesting electrical injury facts—all based on California figures for 1964—that provide food for thought and indicate where greater corrective efforts, educational and otherwise, might well be concentrated.

One out of every three electrical injuries involves portable cords together with their terminations.

One out of every four involves energized parts that are normally insulated, as of course they should *always* be.

One out of every four involves enclosures normally considered as non-current carrying parts.

And one out of every seven involves portable electrically operated tools.

California electrical injury reports reveal one especially significant fact: *three out of every four injuries involve an unsafe condition.*

It is plain that if all unsafe conditions are eliminated, electrical injuries will decline by at least 75%.

The major unsafe electrical conditions are:

- insulations that are damaged, defective, or inadequate;
- parts that are broken, wet, burned, or damaged; and
- equipment that is inadequately maintained.

Another significant fact that emerges from our electrical injury reports is that roughly *four out of every five injuries involve an unsafe act on the part of the worker.*

However, the elimination of unsafe conditions would in most instances protect the worker even against his own shortcomings. That is a point we should never forget.

Six Injury Factors

There are six factors that determine the extent and degree of an electrical injury:

- the type of circuit with which contact is made;
- the voltage of the circuit;
- the resistance offered to the flow of current;
- the value of the current;
- the pathway of the current through the body; and
- the duration of contact with the current.

Low voltage *alternating current* is more dangerous than corresponding *direct current*. However, this is not true of much higher voltages; and direct current voltages above 1,000 volts are more dangerous than A.C. circuits of the same voltages.

The danger of high voltages is generally recognized. What is not as well understood as it *should* be, despite all educational efforts so far, is that ordinary voltages—such as



those used for shop lighting and operation of electrical hand tools—can be fatal.

A current of only *one-tenth* of an ampere, and sometimes even less, can kill.

There is obvious need to make sure that electrical hand tools are positively grounded.

According to some authorities, most industrial electrical hazards are in the lower voltage range of from 120 to 480 volts.

Low voltages are especially dangerous in that they disturb the muscular activity of the heart ventricle.

Contraction of the muscles of the body when good contact is made with a low-voltage circuit is usually insufficient to throw the victim clear; as a rule, he is held in contact with the circuit, and death usually results. Contact with high-voltage circuits, on the other hand, often will throw the victim off; in which case, while he will usually suffer severe burns, he may not die.

Some Facts

The problem of electric shock, and its precise nature and treatment, still are not fully understood. However, we do know *some* things about it.

In the range of voltages from 1,000 to 7,500 volts, contacts which cause current to flow across the body will not only cause shock but will end respiration.

In about 50 percent of these cases the victim can be revived if artificial respiration is administered *immediately*.

Even in extremely high voltages of as much as 66,000 volts, artificial respiration has sometimes proved effective, when started promptly and continued for a long period. But as a rule, such high voltage currents cause permanent damage to the kidneys.

Some authorities emphasize that even in cases of apparent death from electric shock, artificial respiration should be administered for at least two hours after all signs of life have disappeared.

As the result of many laboratory experiments and information from the field, authorities conclude that an alternating current of one-tenth of an ampere at commercial frequencies is enough to kill, if the current flows through the vital organs.

This does not mean, however, that a current of 20 amperes would make death 200 times as certain. In fact the opposite is more often the case.

This is because the flow of a small current through the chest may be enough to destroy the normal rhythm of the heart and interrupt or disturb the muscular activity of the heart ventricle. Under such circumstances, the blood ceases to circulate, and death will usually follow unless artificial respiration is promptly instituted.

A large current, however, produces a severe contraction of the body musculature, including that of the heart, and holds that organ at rest. Then, when the circuit is broken, the heart normally will resume activity automatically, provided that the contact with the current was brief.

It is fortunate that the brain, which is relatively easily influenced by the passage of an electrical current, rarely lies in the path of current. However, in many electrical accidents the current, in passing through the body, produces a block in the nervous system, thereby preventing normal stimuli from the brain reaching some organ.

When breathing has ceased because of electrical shock, the brain will be permanently damaged if its oxygen supply is not restored within three to five minutes. Thus it is of the utmost importance to begin artificial respiration as soon as possible.

The greatest natural protection against electrical shock, particularly that caused by low-voltage currents, is the skin. The resistance that dry skin offers to the flow of electricity ranges from 70,000 to 100,000 ohms per square centimeter. Once the current enters the body, however, the tissues offer a relatively low resistance to the flow.

If the skin is wet from any cause—perspiration, rain, or bathing—the resistance falls to less than one-hundredth of that offered when the skin is dry, and contact with low-voltage circuits becomes more dangerous.

Much heat is generated in the skin at the point or points of contact with the current. If the victim cannot break that contact almost at once, the temperature may be raised high enough to produce blisters, which break the skin and completely destroy any protection it may have initially offered to the flow of current.

Regulations and Enforcement

Effective weapons in any campaign against work injuries are *adequate regulations adequately enforced*.

California's Labor Code gives the Division of Industrial Safety authority to prepare safety regulations which, if approved by the Industrial Safety Board, have the force and effect of law. These regulations, or Safety Orders, which are most democratically established, are the very *minimum* regulations that must be complied with in all workplaces in California.

They are, so to speak, the *floor* of electrical safety, and just the floor. By no stretch of the imagination are they the ceiling. So the Division en-

courages industry to observe stricter standards, and the electrical standards of many California counties and municipalities are often much stronger than the minimums in our Electrical Safety Orders.

There is one interesting difference between our Orders and the National Electrical Code. Our Orders are designed to prevent electrical injuries to workers. The National Electrical Code emphasizes prevention of fires from electrical causes.

Important Rules and Practices

General precautions for electrical safety are too many and too well known for me to relate them all, or in detail. However, it might be well to summarize briefly some of the most important rules and practices that we in California emphasize—rules and practices that *have* reduced, and *can* reduce in future—the toll of electrical injury and death.

- Use equipment that is of nationally approved manufacture, conforming to standards and tests of responsible groups such as the Underwriters Laboratories, Inc., the Canadian Standards Association, and similar organizations.

- Install electrical equipment and wiring so that all live parts are either properly guarded or adequately insulated.

- Insist on good housekeeping during the installation of electrical equipment.

- Provide sufficient room for the safe inspection, repair, or replacement of control equipment.

- Make sure that every employee is thoroughly qualified, in experience and general knowledge, for his particular work.

- Check from time to time that all safety devices are in good operating condition, and that they are used for their precise purpose only.

- Have at least two men work together in any hazardous work that

is performed on or near live conductors or other apparatus.

- Make sure that workers wear approved personal protective equipment for the job.

- Train workmen to satisfy themselves that conditions are safe before commencing work, and to consider every electrical circuit alive and potentially dangerous.

- See that all hand tools are maintained in good operating condition, and impress workers with the importance of avoiding contact of the tools with live circuits or apparatus.

- Shut off the power when examining or making repairs or alterations on light and power circuits.

- Make sure that a foreman, or worker delegated by the foreman, makes a complete check of a circuit before applying power for the first time.

- Make sure that all electric equipment is adequately grounded when installed.

- See that extra precautions are taken before working on damp or wet surfaces, using additional insulation if necessary.

The Remedy

There is no glamorous solution to the problem of electrical injuries and deaths—no dramatic revolution of methods that will completely eliminate the toll.

The remedy lies in observing and applying time-tested safety rules and practices, and in intensifying and accelerating engineering, enforcement, and educational programs.

A sound *engineering* program will insure that all equipment is properly installed, applied, and maintained.

A sound *enforcement* program will discourage employers who cut costs at the risk of injury or death to electrical workers.

It will also help to insure that legal provisions for the safety of workers are thoroughly observed,

with prosecution for the flagrant violator.

A sound *educational* program will enlighten and encourage management to observe *more* than the minimum requirements prescribed by law. It will acquaint or reacquaint management with the fact that work injuries and deaths have repercussions that affect every aspect of society. And it will make electrical workers acutely conscious of the seriousness of electrical injuries.

It will include pamphlets dealing with specific hazards and means of eliminating or controlling them. California's Division of Industrial Safety publications include several electrical brochures:

Ground It!

Keep Away from Power Lines!

Electrical Safety on the Farm

Electrical Safety and Swimming Pools

We must keep on emphasizing that only safe equipment should be used.

We must keep on emphasizing that equipment should be properly installed and properly maintained, with no live parts exposed to accidental contact.

We must keep on emphasizing the need for eternal vigilance in following safe practices, and in guarding against committing unsafe acts.

We must keep on instilling greater safety consciousness in all who have any part in electrical equipment installations—from the engineer who designs them to the workman who installs, uses, or repairs them.

Only then can we greatly lessen the number of victims of one of nature's greatest gifts to mankind—electricity. Only then will we greatly reduce electrical work injuries.

Court Rules Tractors Dangerous for Minors

An employer recently was charged by the DIVISION [OF LABOR LAW ENFORCEMENT] with allowing minors under the age of 16 years to work in an occupation dangerous to life and limb in violation of Section 1294 (1) of the Labor Code.

The burden of the complaint was that driving a tractor was in itself hazardous employment and therefore limited by law to persons over age 16.

The defendant in this action denied he was the employer, stating that he was only the manager. The evidence, however, disclosed that as a Farm Labor Contractor, he was truly the employer.

It also was clear that the minors were under the age of 16, engaged in driving tractors, and had no work permits.

The issue was therefore whether the occupation was in itself dangerous, or dangerous when engaged in by a person who because of his years lacked the experience and judgment necessary for safe operation.

The defendant urged that since it was permissible for minors in agriculture when working for and under the supervision of their parents or guardian to operate tractors, the law did not consider any agricultural work to be dangerous.

The Court, however, found that the relationship of stranger to child was not an altruistic relationship but rather one of economic expediency; and that such economic expediency, when weighed with the more beneficial aspects of protection of life or limb, must give way to the latter consideration.

After considerable study, the judge concluded:

"1. That the defendant was a de facto labor contractor and supervised the activities of his employees or employees placed under his control and direction.

"2. That the agricultural pursuits, driving a tractor by one of immature years and not supervised by a person other than a stranger, is dangerous."

—From Department of Industrial Relations June 1966 Report to Governor's Council

Protection of Workmen in Trenches

Fourteen times as many workers die from caving ditches, trenches and excavations than from other construction work (in proportion to the number of disabling injuries).*

*Out of every 13 workers who receive a disabling injury from cave-ins, one dies.**

Walls of earth may look quite harmless, but they are extremely dangerous unless held in place by adequate shoring and bracing.

Play safe! Don't bet lives on soil conditions! Provide adequate shoring and bracing.

Trenching

California's Construction Safety Orders give minimum requirements only, but distinctly specify that trenches in all types of earth must be guarded against the hazard of moving ground.

It is the employer's responsibility to see that employees are not injured from caving ground.

Experienced construction men offer the following advice, which will be helpful in deciding how much sheeting, in addition to the minimum specified, is required.

Beware of disturbed ground.

Ground that has been filled or disturbed will require additional sheeting and bracing. So will hard compact ground if there is filled ground nearby.

A trench wall that is near another recently filled trench, for example, is unstable, even though it appears to be hard compact material.

Take special precautions where moisture is present.

Provide extra sheeting where there is water or seepage. Keep the excavation pumped out at all times, and avoid any accumulation of water, day or night, until the work is done.

* Based on California figures for 1964-1965.

Guard against rock-like material that softens when exposed to air.

Upon exposure to air and moisture, some rocks, like the greenish serpentines found in California, undergo a softening change called air-slacking. Walls of such rock are hard and solid at the time of excavation, but soften into a slippery, dangerous mass soon after exposure to air.

To prevent this air-slacking, some contractors apply a protective coating of gunite to such walls, in addition to shoring and bracing. Other contractors provide extra sheeting to hold the weakened walls in place.

Guard against caving hazard created by vibration and load from highway traffic.

Trenches located near highways and streets are more likely to cave than similar trenches in locations not exposed to moving loads. Extra sheeting is necessary, and loose rocks and chunks of earth that could fall on men in the excavation should be removed.

Install upper trench jacks first.

When trench jacks are used to hold uprights in place against trench walls, the top jack should be installed first.

The next lower one should be held in position with hooks from above before a man enters the trench at that point to place the lowest jack.

Shoring does not serve its purpose if men expose themselves to hazard while installing it. Most of the installation work should be carried on from a safe position outside of the trench.

Protect all men in trenches.

If a man is needed at the bottom

of the trench near the boom-end of a boom-type trenching machine, he should be protected by metal shields attached to the boom-end.

These shields should be of adequate strength and design to serve as a substitute for shoring and bracing.

Hard Compact Ground

Trenches 5 feet or more deep and over 8 feet long must be braced at intervals of 8 feet or less.

A strut brace is required for each 4-foot zone into which the trench depth can be divided, with at least two braces for each set of uprights.

Steel screw-type trench braces must have a foot or base plate on each end of the pipe, placed horizontally and bearing firmly against uprights. Hydraulic metal jack units, properly maintained and of equivalent strength, also are acceptable.

Timber braces must be in good condition, free from imperfections affecting their strength, well cleated, and rigidly wedged.

Horizontal Strut Braces

Width of Trench Feet (Inch.)	Size of Wood Braces	Sizes of Pipe Braces
1- 3	4"x4"	1½" STD
3- 6	4"x6"	2" STD
6- 8	6"x6"	2" STD
8-10	6"x8"	3" STD
10-12	8"x8"	3" STD

Trenches wider than 12 feet must have braces of correspondingly larger dimensions.

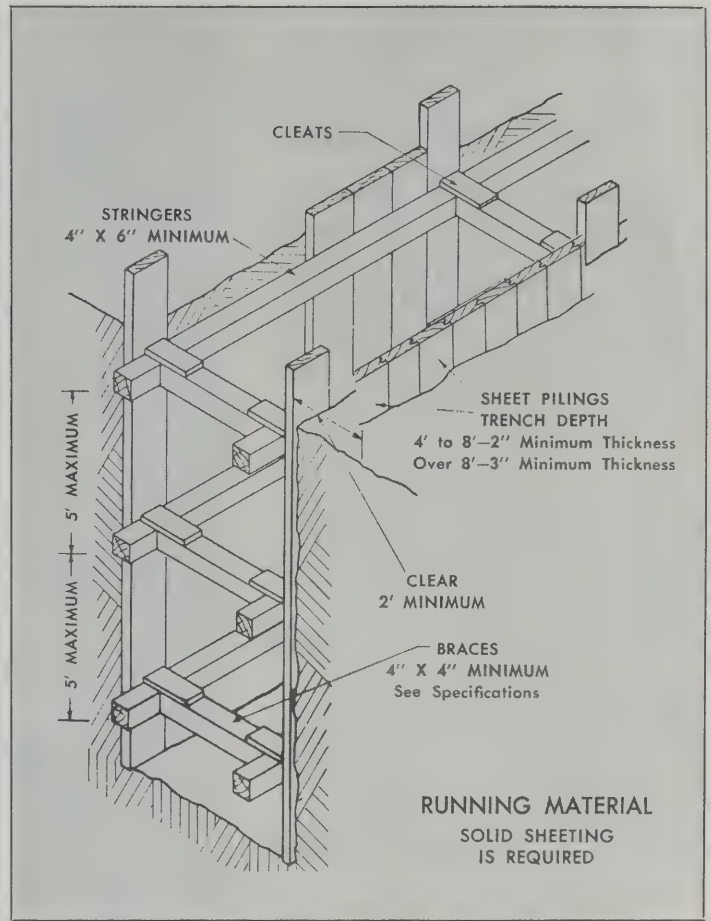
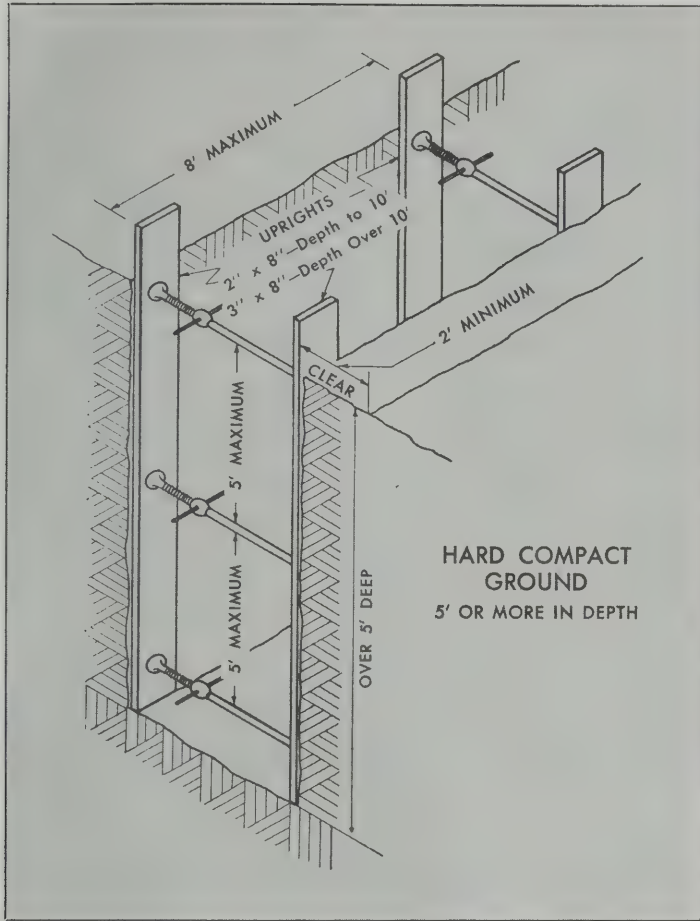
Filled or Unstable Ground

Sheeting must be provided, and must be sufficient to hold the material in place.

Longitudinal-stringer dimensions depend upon the strut and stringer spacing and upon the degree of instability encountered.

Special note: An area restricted by installing forms or similar structures adjacent to the bank of an excavation is termed a trench, and all trench regulations apply. Construction Safety Order 1504 (11 E and O).

Trench Shoring Specifications



Alternate Trench Protection Sloping

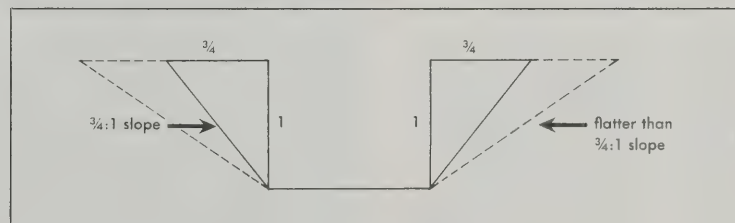
Trench or excavation walls must be sloped no less than $\frac{3}{4}$ horizontal to 1 vertical as an alternate method to shoring. Soil instability may, however, require a flatter slope.

Protective Shields

Protective shields or welder's huts may be substituted for shoring systems to provide local protection for workmen in trenches. Approval of their design and construction shall be secured from the Division of Industrial Safety by the employer before use.

Design by Registered Engineer

A civil engineer, registered in California, may design and submit detailed data to the Division of Industrial Safety for alternate effective



shoring systems. The design must include a soil evaluation study, a slope stability study, and an estimation of forces to be resisted, together with plans and specifications of the materials and methods to be used.

Upon review of the application and supporting data, the Division may accept the provisions of the alternate proposal or add such modifications as appear just and reasonable. See plate C-24-a, b, Appendix, Construction Safety Orders, for engineering design alternate criteria.

Access

In trenches five feet or more deep, ladders must extend at least $2\frac{1}{2}$ feet above the top, unless a safer means of getting in and out of the trench is provided.

There must be a ladder within 50 feet of any worker in a trench.

Pipe Installation

Length or diameter of pipe being installed does not permit variance with shoring requirements. Shoring protection is required within at least 4 feet of any workman.

(This article appears in brochure form as Bulletin 158)

Letters to the Editor...

You are to be congratulated on the topics and format of your CALIFORNIA SAFETY NEWS . . . always read with interest by us.

—Henry J. Bach, Principal Field Services Rep.
The State Insurance Fund, New York, N.Y.

The current issue of CALIFORNIA SAFETY NEWS (June 1966) could very well be used as the core around which to develop a full semester college course on safety and accident prevention . . . You are to be congratulated for having exceeded your own very high standards with this issue of your publication.

—Talmud Kramer, Hospital Health-Safety Coordinator
Camarillo State Hospital

I am Technical Officer on the staff of the Chief Safety Engineer for New Zealand and I find many interesting and useful items in your [CALIFORNIA] SAFETY NEWS.

—Maurice S. Reed
Department of Labour, Wellington, N.Z.

I had an opportunity to read your publication CALIFORNIA SAFETY NEWS while I was attending a conference at the Bureau of Reclamation in Los Banos. I was very impressed by the contents . . . and would like to interweave articles from it into our Division safety program.

—S. R. Macdonald, Asst. State Forest Ranger
Division of Forestry, Los Banos

Thank you for . . . the March 1966 issue of the CALIFORNIA SAFETY NEWS which we found most interesting. The practical approach of the main speakers at your Governor's Industrial Safety Conference was particularly impressive.

—P. Lynch, Secretary
National Industrial Safety Organization, Dublin

We feel that this [*An Alphabet of Industrial Safety*] is an excellent piece of work, and appreciate very much your kindness in granting us permission to reproduce it for the benefit of our members.

—K. L. Steele, Newsletter Editor
American Society of Safety Engineers, Pittsburgh, Pa.

The lead article [in the National Safety Council Pulp and Paper Section *Safety Newsletter*] was taken from your booklet entitled *The Tailgate Safety Meeting*. This made a fine addition to the paper . . . Thank you for having given permission to reproduce it.

—H. R. Mesler, Jr., Director of Safety
The Ruberoid Co., Bound Brook, N.J.

An Alphabet of

By MICHAEL FLAGG, Editor

A is for *Accidents*, which *can* be tabooed.
The very first step is the right *attitude*.

B for the *Boons* safety brings in variety
To workers, their family, home, and society.

C—injury *Costs*, seldom fully revealed;
Like icebergs, the far greater part is concealed.

D is for *Data*, essential to bare
Just *what* are the actual problems, and *where*.

E—*Education*, which has no divorcement
From sound *Engineering* and wholesome *Enforcement*.

F is for *Follow-up*. Surveys are vain
Without *further* check whether hazards remain.

G is for *Guarding*, and it's a disgrace
When guards are not used, or not kept in place.

H for *Housekeeping*, a pretty good gauge
Of whether a firm, *safety-wise*, is of age.

I is for *Injuries*—(outcome of flaws).
They never just *happen*; there's always a *cause*.

J is for *Jargon*. However sincere,
The message is lost if the meaning's not clear.

K is for *Knowledge*. But it isn't enough
To *know* what to do; we must still *do* our stuff.

L is for *Life* and the fruits of our labor.
Work safely, for *your* good and that of your neighbor.

M is for *Maintenance*, powerful pal
To men, to machinery, and to morale.

We find the material—[DIVISION OF INDUSTRIAL SAFETY publications]—very interesting and would like to interject some of the safety ideas into our Midwest Region safety program.

—Russell E. Dickinson, Acting Asst. Regional Director
National Park Service, U.S. Dept. of the Interior

Information that you publish, as well as various articles that appear in your magazine have been . . . of great interest in the field of safety.

—Frank A. Knittle, Safety Engineer
Pacific Indemnity Group, San Francisco

I wish to compliment you and your staff on many interesting facts of various safety steps for preventing injuries.

—J. F. McElravy, Superintendent
California Packing Corporation, Berkeley

Thank you very much for permission to reprint the article [*The Role of the Administrator in Hospital Safety*] . . . We are sure that this article will be of benefit to our safety engineers and hospital administrators.

—R. C. Kjelland, Assistant Chief Engineer
The St. Paul Insurance Companies, St. Paul, Minn.

Industrial Safety

of the California Safety News

N is for **Now**. Let us faithfully vow
To deal with all hazards, and deal with them *now*!

O for **Observance** of all safety rules—
Obeeyed by the wise, disregarded by fools.

P for **Prevention** (far better than cure)
That **Planning** and **Programs** will help to insure.

Q for the **Qualified**. *They* understand
Production and safety should go hand in hand.

R for **Reporting** and **Records**, both needed
For trends to be quickly discovered and heeded.

S—Supervision. And experts agree,
In safety the *competent* foreman is key.

T is for **Training**, designed to instill
The *desire* to work safely, as well as the skill.

U for the **Unsafe work practices** that
Employers, employees, *alike* should combat.

V is for **Vision** in hazard detection,
And also for **Vigor** in hazard correction.

W—Waste (and how it can hurt!)
That safety and safety alone can avert.

X is for **Xmas**, with family cheer
For those who work safely the rest of the year.

Y is for **You**, for whom safety is planned.
It can't be complete unless **You** lend a hand.

Z for the **Zealous**—each one a hero
Who strives to bring injuries closer to zero.

In Lighter Vein

London—An increasing number of young men are getting their long hair caught in machines at work, chief factory inspector R. K. Christy said here yesterday.

His advice to Britain's long-haired youth: "If you cannot cut it off, wrap it in a cap. A peaked cap is a good thing because the peak hits the machine first."

He added: "I once recommended to a lad that a piece of blue ribbon would look nice."—*Reuters*

The London newspaper *The Sun* told a story . . . of a factory which won a plaque for a splendid safety record.

The plaque was being affixed to the wall before a large crowd, the newspaper said, by a foreman who swung the hammer and broke his thumb.—*United Press*

DLS&R Monthly Report...

The DIVISION OF LABOR STATISTICS AND RESEARCH has resumed monthly publication of its report, *Work Injuries in California*, beginning with the September issue.

Persons presently receiving *Work Injuries in California, Quarterly Statistical Summary* will receive the monthly publication also.

Others wishing to be placed on the mailing list for these periodicals should write to the DIVISION OF LABOR STATISTICS AND RESEARCH, P.O. Box 965, San Francisco, California 94101.

The DLS&R recently streamlined its methods of processing work injury reports, with the result that its statistical information is more timely.

Resumption of the monthly publication will provide safety personnel with up-to-date valuable information on job injury trends at a time when both the work force and on-the-job injuries are rising rapidly, and will serve to indicate where greater injury prevention efforts are needed.

Employment of Minors

The article in the June CALIFORNIA SAFETY NEWS on *Employment of Minors—Special Safety Laws Employers Must Observe*, erroneously stated that federal regulations prohibit the employment of minors *under 18* in warehouse and storage operations if employment is subject to the Fair Labor Standards Act.

That prohibition applies to minors under 16.

Child-labor provisions of the Federal Labor Standards Act (the Federal Wage and Hour Law) are contained in *Child Labor Bulletin 101*.

The bulletin, a U.S. Department of Labor publication, is available at 15¢ a copy from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Highlights of the Revised Compressed Air Safety Orders

By J. ROBERT SIGNER, Supervising Engineer, Mineral Industries Section

The revised *Compressed Air Safety Orders*, adopted by the Industrial Safety Board in June, became effective on August 17th, 1966.

They apply whenever men are employed in a pressurized environment—except for diving work, which is not covered by these Orders.

The original *Compressed Air Safety Orders* (adopted in 1933) were prepared to anticipate any compressed air work necessary during the construction of the Golden Gate and San Francisco-Oakland Bay bridges.

There have since been changes not only in construction practices, equipment and material, but also in our knowledge of the physiological processes of those working in compressed air.

The committee formed to amend the Orders consisted of persons with knowledge and experience in compressed air work and the treatment of decompression illness, frequently called *the bends*.

The major change in the revised Orders is the removal of the mandatory split shift that was required in the original Orders.

End of Mandatory Split Shift

In the split-shift method, men work for a given period of time, depending upon the air pressure. They are then decompressed; rest for a specified interval at atmospheric pressure; are recompressed; work for the second shift; and then are decompressed again.

It is during the period of decompression, and shortly thereafter, that decompression illness occurs.

With the single-shift method, workers are subjected to only one decompression during the workday instead of two.

In addition, the time of decompression is *longer* under the single-shift method, so that the number and size of nitrogen bubbles formed in the human body are smaller than those formed during the more rapid decompression time permitted under the split shift.

Better Decompressing Conditions

The revised Orders also provide for greater comfort of the workmen while decompressing. Larger decompression chambers with more seating area and overhead clearance are now required. The revised Orders contain additional requirements relating to compressor plants, air supplies, and telephone communications.

Even though low pressure air is now regulated automatically, a gage tender is still required to be on duty, to use manual overrides in the event of an emergency.

The new Orders require effective communications at all times among the following:

- the working chamber face
- the working chamber side of the man lock near the door
- the interior of the man lock
- the lock attendant's station
- the compressor plant
- the first-aid station
- the emergency lock
- the special decompression chamber

A section on fire prevention has been added. Fire becomes a greater hazard with increased air pressure than at atmospheric pressure.

The section on medical attendance, examination, and regulations has been expanded.

"Pre-employment History" and "Physical Examination" forms, supplied by the DIVISION OF INDUSTRIAL SAFETY, must record tests and examinations showing whether a worker has any disabilities or abnormalities that preclude him from safely working in compressed air.

This is for the worker's own protection.

The revised Orders contain decompression tables for air pressures from 14 to 50 pounds per square inch gage in 2-lb. increments for various exposure times.

Also included are tables that give the decompression times for more than one exposure to compressed air within a 12-hour period.

Observance of the revised *Compressed Air Safety Orders* will provide not only a reasonably safe working environment, but should permit men to work in compressed air with little or no likelihood of developing decompression illness.

Miner's Lamps

A reader calls our attention to the phrase *a miner's lamp* which appeared twice in the article *Don't Gamble with Death in Confined Spaces!* in the June issue of the CALIFORNIA SAFETY NEWS.

We referred to *a miner's flame safety lamp*, a device that is approved by the U.S. Bureau of Mines and that (unlike a miner's lamp or ordinary candle) does not ignite flammable gases.

State Perspective and Policy . . .

(continued from page 2)

Of course safety regulations should be prepared under thoroughly democratic procedures, as is the case in California, and not by mere fiat, if they are to receive the support of both management and labor. Endless safety disputes between these two great segments of industry will be avoided if both groups feel that the standards created provide *necessary* and "*reasonable*" safety. I say "*reasonable*," because we know that absolute safety does *not* exist, and that progress of any nature is usually attended by *some* risk.

I need hardly add that a state safety agency of continuing competency is possible only under an adequate civil service system, with safety engineering personnel appointed from eligible lists established after open competitive examinations.

The second fundamental—the compilation, tabulation, and analysis of *all* disabling work injuries—is necessary to pinpoint precisely *where* major injury prevention efforts might well be directed.

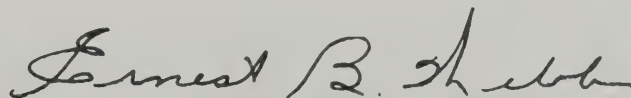
The analysis might disclose that a *specific* industry, or an area *within* that industry, needs greater attention. Or it might show that specific accident types are the villain.

In California, for instance, statistics reveal an illuminating and unchanging pattern during the last twenty or more years that we have been able to prepare comprehensive work injury statistics:

Three out of every four work injuries are caused by three accident types: falls and slips; strain or over-exertion; and striking against objects or being struck by them.

As for the third fundamental, it is a truism that safety must have actual top level sponsorship if it is to enlist the respect and support of all other levels, including the rank and file.

Nothing is more valuable than consistent action by a state's governor and legislature proving their profound concern for on-the-job safety. That concern provides an industrial safety climate that will affect every aspect of our society for the better.



Ladders Take Their Toll . . .

Men have been using ladders for thousands of years. It has become almost as natural to use a ladder as it is to use a knife and fork.

So we take ladders for granted, give little thought when climbing or working from them—and pay the penalty in injury and death.

In California in 1965, ten workers were killed and 4,873 workers disabled from ladder accidents in industry alone, according to reports received by the DEPARTMENT OF INDUSTRIAL RELATIONS.

How to Avoid Ladder Accidents

Ladder accidents are usually caused by two things:

1. Use of unsafe ladders.
2. Unsafe use of safe ladders.

If three common-sense precautions are taken, practically all ladder accidents and injuries will be avoided:

1. *Select the right ladder for the job.*
2. *Check the condition of the ladder.*
3. *Use the ladder safely.*

Select the Right Ladder

First of all, select the *right type of ladder* for the job to be done.

Don't use a ladder that is too long or too short for the job.

Don't use two ladders spliced together.

Don't use a light household ladder for a heavy construction job.

Don't use metal ladders near electrical circuits or power lines.

Check the Condition of the Ladder

After selecting the right type of ladder, check it before using it.

Check it for cracked or split side rails.

Check it for missing, broken or otherwise defective steps (cleats, rungs, treads or U-shapes) by placing the ladder flat on the ground and walking on the rungs.

Check it for sharp edges and splinters on cleats and rungs and side rails.

Check it for general weakened condition.

If it is found to be unsafe, withdraw it from use and fix it at once if possible. If it cannot be fixed, destroy it immediately, to make sure it will never be used again.

(The above is part of the revised text of the DIVISION OF INDUSTRIAL SAFETY's Bulletin 121, *Ladder Safety Step by Step*.)

Recent Convictions for Violations of Safety Orders . . .

Vincent Rodrigues, a Hayward contractor, and Joel Souza, a foreman, were found guilty of permitting workmen to work in unshored trenches 12 and 16 feet deep.

Rodrigues was fined \$50, Souza \$25 (suspended), and both were placed on informal probation for one year.

Judge James Duvaras, Jr., rendered the verdict in Sunnyvale Municipal Court on February 2nd, 1966.

Assistant District Attorney Charles Dresow prosecuted.

One of the trenches is pictured on the front cover of this issue of the CALIFORNIA SAFETY NEWS.

Dravo Corporation, superintendent J. Green, and crane operator Charles Fisher, were each fined \$25 plus \$4 court costs for allowing a crane boom to contact an overhead power line.

A laborer guiding a pipe at the time was injured, fortunately not fatally.

Judge Joseph F. Aleck, Jr., rendered the verdict on July 11th, 1966, at Redding Justice Court.

District Attorney Robert W. Baker prosecuted.

Norman H. Durston, doing business as Norman H. Durston, Plastering Contractor, of Newport Beach, pleaded "no contest" to the charge of repeatedly violating Construction Safety Orders relating to the construction of light-trade pole scaffolds made of wood.

The contractor was fined \$250 and placed on probation for one year.

Judge J. Parley Smith imposed sentence in Laguna Beach-San Clemente Municipal Court, Laguna Beach, on July 7th, 1966.

Deputy District Attorney A. Lee Stanton III prosecuted.

The American Building Maintenance Co. of Los Angeles, and several officers, were convicted on various counts relating to lack of safety measures during the use of a suspended scaffold, particularly for failure to insure that men

on the scaffold were positively attached to safety lines.

In the case in point, one worker was killed and another badly injured when one end of the scaffold dropped on March 9th, 1966.

The company itself was fined \$500.

Five officers were each fined \$250, and in addition received a three-year sus-

pended sentence of a fine of \$500 plus six months in the county jail.

The company and officers were placed on probation for that period.

Judge Sherman Smith rendered the verdict in Los Angeles Municipal Court, Division 20, on July 7th, 1966.

Deputy City Attorney Warner H. Biscailuz prosecuted.

SEVEN-MONTH BOX SCORE Disabling Work Injuries and Deaths in California

Month	Disabling Work Injuries ^a			Deaths		
	1966	1965	1964	1966	1965	1964
January	16,448	14,403	14,534	65	73	63
February	13,601	14,156	13,911	55	42	60
March	16,073	15,860	16,066	59	48	56
April	15,115	14,025	15,514	73	51	62
May	17,560	15,315	14,944	65	62	56
June	16,117	14,965	15,023	53	64	64
July	17,469	14,931	16,847	52	74	50
7 month total	112,383	103,655	106,839	422	414	411

Injuries up 8.4% from 1965
Employment up 4.8% from 1965

^a Disability causing absence from work for a full day or shift beyond the day of the injury.

(Source: Division of Labor Statistics and Research)

Safety Orders Available at Documents Section

The following Safety Orders are available from Documents Section, P.O. Box 1612, Sacramento, California 95807.

Where Safety Orders have been revised (as almost all of them have been), the date is the date of the latest revision.

Money orders or checks made payable to the Documents Section must accompany all purchase orders. Don't send stamps.

Documents Section gives a 10% discount on purchases of 50 or more copies of any one title.

Don't forget to add 4% sales tax if you live in California.

	Price	With sales tax
Aerial Passenger Tramway Safety Orders (1956).....	\$0.50	\$0.52
Boiler and Fired Pressure Vessel Safety Orders (1955).....	.50	.52
Compressed Air Safety Orders (1946).....	.50	.52
Construction Safety Orders (1965) bound 4 1/2" x 7 1/2"	1.50	1.56
in loose-leaf form 6" x 9".....	3.00	3.12
Electrical Safety Orders (1962).....	1.50	1.56
Elevator Safety Orders (1954).....	1.00	1.04
General Industry Safety Orders (1963).....	1.00	1.04
Logging and Sawmill Safety Orders (1958).....	1.00	1.04
Mine Safety Orders (1958).....	.75	.78
Petroleum Safety Orders—Drilling and Production (1959).....	1.00	1.04
Petroleum Safety Orders—Refining, Transportation and Handling (1951).....	.75	.78
Pneumatic Explosives Loading Safety Orders (1944), Quarry and		
Open Pit Mine Safety Orders (1953).....	.75	.78
Ship and Boat Building Safety Orders (1961).....	.50	.52
Tunnel Safety Orders (1962).....	.75	.78
Unfired Pressure Vessel Safety Orders (1964).....	.75	.78
Window Cleaning Safety Orders (1952).....	.50	.52

Deaths From Overturning Farm Tractors . . . the Toll Continues

Unsafe practices of operators and lack of safety devices continue to make many agricultural tractors vehicles of injury and death.

Overturning farm tractors caused the death of 11 California workers last year.

It points up the need for proper instruction on safe practices in the use of tractors, and for installation and use of effective safety devices—roll bars and safety belts.

An article in the December 1962 issue of the CALIFORNIA SAFETY NEWS discussed the tragic toll from farm tractors. We quote a few paragraphs from it:

"There is no doubt that a roll bar or canopy would give the operator a far better chance of escaping injury or death if a tractor overturns into an irrigation ditch or canal."

There is also no doubt that unsafe work practices are at the root of most overturning farm tractor accidents.

"We *invite* tipovers if we hitch loads above the drawbar, or pull too heavy a load uphill, or drive too fast on rough ground or while making a turn . . .

"We *invite* trouble if we use a tractor at excessive speed. A tractor is *not* designed for fast travel."

Here are facts relating to some of the 11 deaths in 1965 caused by overturning farm tractors.

A 16-year-old boy, working as a fruit checker in a peach orchard, was sent out with a rubber-tired tractor to pick up empty peach boxes. He was driving too fast, other workers reported later.

When he did not return in due time, a worker was sent to look for him, and found him crushed under the overturned tractor in a ditch at the end of the field.

The tractor was not equipped with a canopy or seat belts.

A ranch foreman was cutting grass in an avocado orchard with a mower pulled by a small tractor.

When he backed the vehicle to make a tight turn near the edge of the orchard, the wheels spun on a 3-foot bank next to the road to the ranch house, and the trac-

tor overturned, crushing the driver under the right front fender and wheel.

Seat belts and roll bars probably would have saved his life.

A tractor driver, in an attempt to help remove a fuel trailer stuck in the mud, drove to the back of the trailer to push it.

The ground was very slippery; and when he applied power, the front end of the tractor rode up the back of the trailer. The tractor flipped over backward and crushed the driver beneath the steering wheel.

Seat belts and roll bars would probably have saved his life.

A ranch caretaker lost control of a caterpillar-type tractor on a ranch road, and drove over the edge of the road. One tread dug into the soft dirt of the bank, and the vehicle overturned.

The driver was thrown out and landed at the bottom of the embankment, the tractor coming down on top of him.

The vehicle had neither seat belts nor roll bars.

A farm laborer, plowing a field with a spring-tooth plow behind a tractor, speeded up and down the rows in fifth gear, using the turning brake (at the end of each row) to effect faster and sharper turns.

Making sharper turns allowed him to

plow the row beside the one he had just finished, rather than plowing alternate rows. On one of the turns, he apparently misjudged his distance, and crossed a 20-foot wide dirt road at the end of the field.

With one wheel already over the embankment of a shallow slough, he tried to turn, and the tractor overturned. He was pinned beneath the tractor in the slough and drowned in the mud.

The vehicle was not equipped with a canopy or roll bars.

A tractor driver who had been raking hay was found crushed beneath the seat of the tractor which had overturned. The hillside was too steep for the small tractor with its heavy hay rake.

The vehicle had neither seat belts nor roll bars.

A farm tractor driver pulled a tank truck trailer loaded with 600 gallons of weed oil behind a 4-wheel tractor, while a helper sprayed weeds beside a shallow drainage ditch. The operator drove too close to the bank, and the trailer slid into the ditch, overturning the tractor.

With the helper unable to pull him out, the driver drowned in two feet of water before a tow-truck could free him.

There were no seat belts or roll bars on the tractor.

Offices of the Division of Industrial Safety

The following is a list of main and field offices of the DIS.

MAIN OFFICES

SAN FRANCISCO	455 Golden Gate Ave.	557-1946
Los Angeles	3460 Wilshire Blvd.	381-5695

OTHER OFFICES

Bakersfield	225 Chester Ave.	324-6437
Chico	341 Broadway	343-5182
Eureka	619 Second St.	442-5748
Fresno	2550 Mariposa St.	268-7151
Long Beach	230 East 4th St.	432-8443
Merced	550 West 22nd St.	723-4561
Oakland	1111 Jackson St.	834-3460
Redding	2115 Akard Ave.	241-5100
Sacramento	1107 Ninth St.	445-5818
Salinas	307 Soledad	424-4807
San Bernardino	303 West Third St.	888-9321
San Diego	1350 Front St.	232-4361
San Jose	888 North First St.	294-1525
Santa Ana	1624 West 19th St.	547-1603
Santa Barbara	411 E. Canon Perdido	966-2918
Santa Rosa	750 Mendocino Ave.	542-8802
Stockton	31 E. Channel St.	466-3547
Ukiah	305 North Main St.	462-8850
Ventura	3418 Loma Vista Road	642-9679

Disabling Work Injuries^a and Injuries Per 1,000 Workers, by Industry, California, 1964-65

(Compiled by the Division of Labor Statistics and Research, California Department of Industrial Relations)

INDUSTRY	1965		1964	
	Number of Injuries	Injuries per 1,000 workers ^b	Number of Injuries	Injuries per 1,000 workers ^b
All industries.....	182,046	31.3	182,173	32.3
Agriculture.....	15,843	67.8	16,022	65.4
Mineral extraction.....	1,962	61.7	2,043	66.1
Metal mining.....	129	61.4	126	70.0
Crude petroleum and natural gas production.....	1,508	70.1	1,460	69.2
Nonmetallic mining and quarrying.....	325	39.6	457	57.1
Construction.....	24,631	75.6	28,209	82.9
Building contractors and operative builders.....	7,296	74.0	8,755	85.8
General contractors, other than building.....	4,877	69.1	5,109	73.7
Special trade contractors.....	12,458	79.5	14,345	84.8
Manufacturing.....	47,286	33.6	45,060	32.4
Food and kindred products.....	10,771	64.3	10,560	62.9
Textile mill products.....	384	50.5	299	42.1
Apparel and other fabricated textile products.....	858	12.8	857	13.3
Lumber and wood products (except furniture).....	4,932	96.5	5,375	101.6
Furniture and fixtures.....	1,900	58.6	1,931	59.4
Paper and allied products.....	841	27.5	801	26.6
Printing, publishing, and allied industries.....	1,691	21.0	1,661	21.4
Chemicals and allied products.....	1,579	33.5	1,388	30.5
Petroleum products.....	364	12.7	353	12.1
Rubber and miscellaneous plastics products.....	1,583	57.8	1,394	52.2
Leather and leather products.....	164	28.3	171	30.5
Stone, clay, and glass products.....	2,262	44.2	2,437	48.8
Primary metal industries.....	2,809	52.2	2,436	46.8
Fabricated metal products.....	5,204	52.8	4,540	47.1
Machinery (except electrical).....	3,530	35.3	3,055	31.8
Electrical machinery, equipment, and supplies.....	2,393	12.3	2,267	11.8
Transportation equipment.....	4,344	19.8	4,006	18.7
Motor vehicles and equipment.....	1,207	35.3	1,099	35.7
Aircraft and parts.....	1,839	11.1	1,676	10.2
Ship and boat building and repairing.....	480	46.2	465	46.5
Other transportation equipment.....	818	N.A.	766	N.A.
Instruments and related products.....	548	19.4	430	15.9
Miscellaneous manufacturing industries.....	1,129	N.A.	1,099	N.A.
Transportation, communication, and utilities ^c	15,664	39.1	15,254	39.0
Street, highway, and local railway passenger transportation.....	1,418	53.6	1,381	51.7
Motor freight transportation and warehousing.....	7,172	88.2	6,966	89.1
Air transportation and allied services.....	1,342	37.2	1,063	31.9
Other transportation and transportation services.....	980	N.A.	1,031	N.A.
Communication.....	693	6.1	596	5.6
Utilities.....	4,059	N.A.	4,217	N.A.
Trade.....	33,719	26.5	34,034	27.8
Wholesale.....	8,501	25.8	9,014	28.2
Retail.....	25,218	26.7	25,020	27.7
Building material, hardware, and farm equipment.....	1,542	36.7	1,820	43.0
General merchandise.....	3,399	19.4	2,902	17.5
Food stores.....	5,030	37.8	5,004	39.2
Automotive dealers and gasoline service stations.....	5,271	33.3	5,280	34.9
Apparel and accessories.....	559	8.7	521	8.4
Furniture, home furnishings, and equipment.....	1,069	23.2	1,077	24.2
Eating and drinking places.....	6,572	29.6	6,666	31.5
Miscellaneous retail trade.....	1,776	17.2	1,750	17.6
Finance, insurance, and real estate.....	2,523	8.1	2,435	8.2
Service.....	17,756	16.6	17,468	17.1
Hotels and lodging places.....	1,976	30.4	1,960	30.9
Personal services.....	1,453	14.8	1,475	15.8
Business services.....	2,912	19.3	2,797	19.2
Automobile repair services and garages.....	2,093	47.5	2,243	53.8
Miscellaneous repair services.....	827	40.3	771	39.9
Motion pictures.....	588	13.6	488	12.2
Amusement and recreation services.....	1,502	30.7	1,538	31.6
Medical and other health services.....	3,577	17.6	3,302	17.3
Miscellaneous services.....	2,828	N.A.	2,894	N.A.
State and local government ^c	22,616	30.6	21,599	31.6
State.....	4,690	25.0	4,475	25.5
Local.....	17,926	32.2	17,124	33.4
Industry not reported.....	46	---	49	---

^a Disability causing absence from work for a full day or shift beyond the day of the injury.

^b Rates are preliminary, being based on employment figures that are subject to revision.

^c The number of injuries to employees of publicly operated utilities is included in the injury figures for the transportation, communication, and utilities division; however the rates of injuries is included in State and local government injury rates.

N.A.—Information not available.

Yours for the Asking

To those interested in accident prevention in industry, a number of publications of the DIVISION OF INDUSTRIAL SAFETY will be of value.

They are yours for the asking—free!

For obvious reasons, we do not send more than three complimentary copies of any brochure to anyone outside the State.

Bulletin 103, "Safe Handling of LP-Gas," gives the use and characteristics of LP-Gas and rules for safe handling.

Bulletin 104, "Ground It!" explains the need for grounding electrical hand tools.

Bulletin 106, "Ladders on the Farm," gives pointers to reduce the high rate of farm ladder injuries.

Bulletin 107, "The Ship-Shape Shop," shows the value of good housekeeping.

Bulletin 108, "Taming the Circular Saw," deals with a useful but dangerous tool.

Bulletin 110, "Tips for Hotel Workers," is a guide to safety in hotel work.

Bulletin 111, "Farm Safety Check List," is a safety guide for everyone on the farm.

Bulletin 117, "Stop Grinding Out Injuries!" describes abrasive wheel precautions.

Bulletin 120, "Safety Rules for Painters," shows how to prevent injuries to painters.

Bulletin 121, "Ladder Safety Step by Step," explains how to avoid ladder accidents.

Bulletin 122, "Handy Rules for Hand Tools," describes the proper care and use of many common tools.

Bulletin 125, "Are You Using Carbon tet?" deals with a hazardous chemical.

Bulletin 127, "Look Out for Yourself When You Are Around Crop Spraying," is directed to the farm workers. (Available in Spanish also)

Bulletin 128, "If You Work in a Quarry," covers quarry and open pit mine workers.

Bulletin 133, "Analysis of California Logging and Sawmill Fatalities," contains a study of logging and sawmill deaths in California.

Bulletin 137, "Skin Trouble is Plenty Trouble," deals with the most common disease you can get at work.

Bulletin 140, "Keep AWAY From Power Lines!" is about the hazards of overhead electric power lines.

Bulletin 141, "Power Hand Saw Safety," gives causes of power hand saw injuries.

Bulletin 142, "Read and Understand the Label!" reminds us of a vital need.

Bulletin 143, "Trade Association Safety Programs," reveals their value.

Bulletin 144, "The Know-How of Wire Rope Safety," gives valuable pointers.

Bulletin 150, "Electrical Safety and Swimming Pools," describes precautions to make swimming pools safe electrically.

Bulletin 151, "Control of Noise in Industry," describes methods for either eliminating or controlling excessive noise.

Bulletin 153, "Electrical Safety on the Farm," tells how to guard against electrical hazards.

Bulletin 154, "The Tailgate Safety Meeting," gives pointers on an effective means of promoting on-the-job safety.

Bulletin 155, "Pesticide Regulations," tells how to guard against hazards in the use of pesticides containing organic phosphates.

Bulletin 158, "Protection of Workmen in Trenches," describes measures to reduce the heavy death toll in excavations.

Form 634, "Responsibilities — Employer and Employee," prescribed in California Labor Code. An 8½" x 11" placard. (Available in Spanish also)

Form 657, "Accident Prevention Program for the Construction Industry," contains requirements every construction employer must observe.

Available reprints include:

Power Press Safety

Transportation of Workers — Current California Regulations

Lifting with Safety (Limit within California, 100 copies for any organization; 1 copy for any individual.)

If You Move—

If you move, and wish to continue receiving the CSN, please notify us of your new address.

Next GISC—Feb. 2nd & 3rd

The next annual two-day meeting of the Governor's Industrial Safety Conference will be held at the **Biltmore Hotel, Los Angeles, on February 2nd and 3rd, 1967.**

Full particulars will be announced later.

Meanwhile, those planning to stay at the Biltmore during the Conference may wish to make reservations with the hotel direct, and state that they will be attending the GISC.

From
DEPARTMENT OF INDUSTRIAL RELATIONS
DIVISION OF INDUSTRIAL SAFETY

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Your Editor Calls It a Day . . .



Because of ill health recently, I am calling it a day with the preparation and publication of this issue of the CALIFORNIA SAFETY NEWS.

I regretfully leave State employ after more than seventeen years with the DIVISION OF INDUSTRIAL SAFETY—with the duties of Editor of the CSN since 1953, Supervisor of the Educational Section since 1954, and Coordinator of the Governor's Industrial Safety Conference since 1955.

I am particularly happy to have been Editor of the CALIFORNIA SAFETY NEWS, and to have noted its increasingly fine reputation the last decade or so as a periodical unique in its field.

My thanks go to all who have contributed to the CSN in one way or another, and to those whose appreciative comments have stimulated the maintaining of exceptionally high standards of originality, timeliness, and quality of articles, simply and clearly presented.

From my address at 4345 California Street, San Francisco (94118), I hope to be available from time to time for a limited number of specific safety assignments—the preparation or editing of speeches, film scripts, and articles.

Michael Flagg
(Michael Flagg)

Don't Gamble With Death in Confined Spaces.....	Page 4
Employment of Minors.....	Page 3
Lumber Industry Trims Injury Rate.....	Page 8
The Role of the Administrator in Hospital Safety.....	Page 10

Worker in steel construction yard using explosimeter to check for flammable vapors within a painted bridge member. Note gas mask for protection against the vapors, which are toxic.



California Safety News

Volume. 50, No. 2, June 1966

The California Safety News is mailed free of charge to those interested in industrial safety

A Notable Accomplishment...

Final figures for 1965 show that the disabling work injury rate in California reached an all-time low of 31.3 injuries per 1,000 workers.

This accomplishment was achieved despite conditions that normally contribute to an *increase* in injury rates.



In periods of rising employment and expanding production such as California has experienced for the past decade or more, there are several factors that make for lesser safety:

—*the employment of new workers, many insufficiently trained and not yet as safety conscious as they should be;*

—*the transfer of experienced workers into other jobs with which they may not be familiar;*

—*pressure on production to keep pace with heavy demand, sometimes resulting in a blind eye to unsafe practices and methods; and*

—*increase in overtime, which may make for fatigue and less alertness on the part of workers.*

The notable safety record achieved by California industry last year is, in the circumstances, all the more outstanding, and a cause for congratulation to management, labor, insurance companies, government, and all others who had a share in attaining it.

May the same dedication to greater safety on the job prevail in our state this year.

Ernest B. Webb

In This Issue...

A warning employers and employees should well heed is sounded on page 4: *Don't Gamble with Death in Confined Spaces!*

* * * * *

With schoolchildren free for summer work, we present some reminders about *Employment of Minors—Special Safety Laws Employers Must Observe*. Page 3.

* * * * *

An expert in his field depicts the importance of *The Role of the Administrator in Hospital Safety*. Page 10.

* * * * *

For a description of the *Silver-Cadmium Solder Hazard*, turn to page 7.

* * * * *

There are cheerful statistics for logging and sawmills as *Lumber Industry Trims Injury-Frequency Rate*. Page 8.

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Employment of Minors—Special Safety Laws Employers Must Observe...

(SIGMUND ARYWITZ, State Labor Commissioner, brings us up to date on State and Federal Safety Laws that apply to the employment of minors.)

For the benefit of employers, we summarize State and Federal laws governing the *employment of minors*—special laws designed to safeguard the health and safety of our very young workers.

Employers are reminded that the law frowns on the illegal employment of minors. If illegally-employed minors are injured at work, the employer's liability for compensation is increased 50%; and *the employer cannot insure himself against this penalty.*

Safety Laws Covering Minors

Most Federal laws apply to minors *under 18*. Most California employment laws apply to the work safety of minors *under 16*.

In employment subject to the United States Fair Labor Standards Act, *both* Federal and State laws apply, *with the higher standard prevailing* wherever there are differences.

We can take, as an example, the laws prohibiting minors from working in or about plants manufacturing or storing explosives. California's minimum age for this work is 16; the Federal, 18.

In effect, no minor under 18 may be employed in or about a California plant manufacturing or storing explosives if the employment is subject to the Fair Labor Standards Act.

The following are some of the fields in which both State and Federal laws prohibit the employment of minors because hazards are greater than normal.

Bakeries: Operation of any bakery machine.

Excavation Operations

Explosives: In or about plants manufacturing or storing explosives.

Hoisting Apparatus: In operation of elevators or other power-driven hoisting apparatus.

Logging and Sawmills: All occupations.

Metal: Any operation of power-driven metal forming, punching and shearing machines.

Mining: All occupations.

Motor Vehicles: Driving or making delivery from motor vehicles.

Paper: Operation of any paper-products machine.

Roofing Operations

Woodworking: Operation of any power-driven woodworking machine.

Federal Prohibitions—Under 18

If employment is subject to the Fair Labor Standards Act, *minors under 18 cannot work*

—*in slaughtering, meat packing, and rendering plants*

—*in occupations where there is exposure to any radioactive substance*

—*in the manufacture of brick, tile, and similar products*

—*in warehouse and storage operations*

—*in wrecking, demolition, and shipbreaking*

—*in the operation of circular saws, band saws, and guillotine shears*

—*in occupations involving power driven machines other than office machines*

Federal Prohibitions—Under 16

By Federal regulations, *minors under 16 may not work*

—*in manufacturing, mining, or processing operations*

—*in any occupations in workplaces where manufacturing, mining, or processing operations are conducted*

—*in communications and public utilities except for office or sales work*

—*in transportation of persons or property*

State Prohibitions

California law prohibits employment of minors in occupations connected with *any process in which dangerous or poisonous acids, dyes or gases are used, or in which injurious dusts are present.*

California prohibition against employment of minors also covers:

Construction: All occupations in construction work.

Machinery, General: On or near moving machinery of any kind; on or

near power-driven machinery, moving or at rest; oiling, wiping or cleaning machinery, or adjusting or lacing belts.

Other: Among other prohibited occupations are those of assorting, manufacturing or packing tobaccos; upon any railroad or on any vessel within the jurisdiction of the state; or in any bowling alley.

Under 21 Prohibitions

California has two special work prohibitions for minors *under 21*.

Workers between 18 and 21 may not use, handle, or transport explosives, or be allowed in any explosives magazine, except under the direct personal supervision of an experienced competent man over 21 years of age.

No one under 21 may act as a hoistman to raise or lower men in construction or tunnel operations, or in any quarry, open-pit mine or underground mine.

California is most definite against minors working in unsafe environments. For in addition to enumerating specific occupations that are banned for minors, California law provides that *no minor under 16 years of age may be employed "in any occupation dangerous to the life or limb or injurious to the health or morals" of minors.*

Employment in any capacity which is clearly hazardous is illegal, even though the occupation is not particularly specified.

For example, any work connected with insecticides is considered hazardous, as is the lighting of smudge pots. Also considered hazardous is the operation of tractors by minors under 16, except on farms owned and operated by the parents of the minor concerned.

Digest of Laws Available

Full particulars of safety and health laws governing employment of minors (and laws on work permits, hours of employment, and minimum ages) are given in *Digest of California Child Labor Laws*, available from any office of the DIVISION OF LABOR LAW ENFORCEMENT of the DEPARTMENT OF INDUSTRIAL RELATIONS.

Don't Gamble with Death in Confined Spaces!

Every year California workers are killed or injured on the job because of dangerous amounts of gases or vapors, or because of not enough oxygen, in places where they work.

Such places, which are called *confined spaces*, include sewers, pipelines, manholes, storm drains, tunnels, vaults, chemical tanks, oil tanks, storage bins, silos, and brewery vats.

A *confined space* is not necessarily enclosed on all sides like a room. It can even be an open pit or sump.

Most people who have died or been seriously injured in confined spaces had little idea of the grave dangers they would be facing in entering them, or of the need to protect themselves.

It is the *employer's responsibility* to check for safety in confined places, to see that workers *know* of any hazards that exist, and to make sure that they are *protected* in every way possible.

A little knowledge can be dangerous, and the duty of determining whether an area is a confined space should not be left to the average foreman, but to competent, experienced personnel.

If employers have the slightest doubt whether or not a workplace is a *confined space*, they should either get in touch with a competent consulting chemist, or call any office of the DIVISION OF INDUSTRIAL SAFETY for information and help.

Confined Space Hazards

There are several types of hazards that may be found in confined spaces:

toxic gases or vapors—gases or vapors that poison

flammable gases or vapors—gases or vapors that ignite easily

asphyxiant gases—gases that cause suffocation

lack of oxygen

Any one or more of these hazards may be present in a confined space.

Some substances present more than one type of hazard.

Toxic Gases

Carbon monoxide is a real killer.

It is especially dangerous because it is odorless, colorless, and non-irritating.

Carbon monoxide is formed whenever fuel containing carbon is burned. It is produced in many industrial processes, and also by industrial machines (such as fork lifts) that have an internal combustion engine.

Hydrogen sulfide is another extremely poisonous gas, even in small quantities. Although it has little use in industry, it is quite common as a by-product of many industrial processes.

It is present wherever sulfur or its compounds are found or used, such as oil refineries, mines, and sewers.

Some other poison gases that may be found in confined spaces are:

Hydrogen cyanide, used in separating metals from their ores and preparing them for use, by smelting, refining, or other means;

Sulfur dioxide, used in the manufacture of plastics and solvents; and

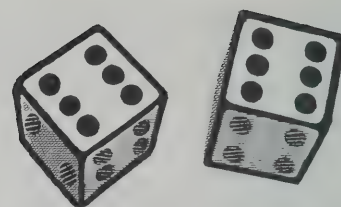
Carbon disulfide, used in the manufacture of textiles.

Flammable Gases and Vapors

Many flammable gases and vapors are heavier than air. For this reason, they may flow into pits, tank openings, and other confined spaces, to become serious fire and explosion hazards.

Flammable gases common in industry are acetylene, butane, propane, hydrogen, carbon monoxide, methane, natural gas, and manufactured gas.

The vapors of flammable liquids such as gasoline, benzene, naphtha, and methyl alcohol can form explosive mixtures.



Many of these flammable gases are also toxic, irritant, or asphyxiant, and are therefore harmful if breathed or absorbed through the skin.

Asphyxiant Gases

Asphyxiant gases interfere with the supply or use of oxygen in the body, thus causing suffocation.

There are two types of such gases—*simple asphyxiants* that reduce the amount of oxygen in the air, and *chemical asphyxiants* that affect the oxygen-carrying functions of the body.

Nitrogen and **helium** are examples of simple asphyxiants. Although non-toxic, they are dangerous if present in large enough concentrations to prevent sufficient oxygen from entering the lungs.

Carbon monoxide, although classified as a poison, is really a chemical asphyxiant, for it reduces the oxygen-carrying capacity of the blood, even though the lungs are well-supplied with oxygen.

Hydrogen sulfide, a chemical asphyxiant, paralyzes the respiratory center in the brain. As little as $\frac{1}{2}$ percent in the atmosphere will cause immediate death.

Carbon dioxide, a simple asphyxiant, often occurs in harmful amounts in sewers, storage bins of grain elevators, caves, old wells, mines, tunnels, and brewery and wine vats.

Irritant Gases

Irritant gases injure the air passages of the lungs.

Ammonia is one of the more common gases in this classification. It is widely used as a fertilizer in agriculture and as a refrigerant.

Some Examples of Injuries and Deaths in Confined Spaces

Here are a few of scores of deaths and injuries in confined spaces in the last ten years, and ways of preventing them.

As a bookkeeper in a winery walked on a catwalk extending above wine-fermenting tanks, his clipboard slipped from his hold and dropped into a tank. Without notifying anyone, he went down after it. Sludge at the bottom of the tank had formed carbon dioxide, and the bookkeeper was asphyxiated.

Fermenting tanks containing sludge should be sealed against entry except when necessary work is being done.

A painter, working inside an inadequately ventilated barge, inadvertently struck and broke a portable light. The glowing filament ignited an explosive mixture developed by the paint fumes, and the painter was burned to death.

Provide adequate ventilation to maintain the atmosphere below 20 percent of the lower explosive limit, and portable explosion-proof lighting equipment.

Two men climbed down a 100-foot ladder to the bottom of a testing hole at a dam site, to take readings on the dam stability. They were overcome by lack of oxygen, and subsequently died. No ventilation had been provided.

On jobs like this, test before entry, or as you descend. One means of testing is a miner's lamp.

Two men were painting the inside of a railroad tank car, with adequate ventilation. When the yard crew were through for the day, they shut off the ventilation to the tank car, neglecting, however, to inform the workers in the car that it was quitting time. These two workers were affected by the paint solvent fumes, but somehow managed to get out, as fortunately there was enough natural ventilation from the top manhole to dilute the fumes.

Make certain that all employees know that they must not turn off ventilators to a confined space without first making certain that there is no one in it.

A workman removed the manhole cover from a long unused barge, and climbed down into a compartment to evaluate how watertight it was. The atmosphere in the compartment did not contain enough oxygen to sustain life, and the worker was overcome and died.

In such jobs, the compartment should be tested before anyone enters it.

A worker was at the bottom of a wine fermenting tank cleaning out the sludge, while a standby watched him through the top of the manhole. The sludge had developed carbon dioxide, and the worker was overcome. The standby called for help; but

without waiting for it to arrive, went down into the tank alone to attempt a rescue. Both men were unconscious by the time help came. Ironically, the first victim survived, but the standby died.

A fermenting tank should be tested before entry and ventilated.

Anyone working in such a tank should be wearing a belt harness with lifeline attached.

A standby should not enter a confined space without an air supplied respirator.

An oiler was scalded to death while working inside a boiler when a valve was opened, allowing steam and hot water to pour in on him.

Before a worker enters a boiler, either blank off the boiler from the source of steam or hot water, or lock the valve in the closed position.

While a construction laborer was cleaning a pipe that connected a gauging manhole with a sewer manhole, he was overcome by hydrogen sulfide gas that filled the work area, and died.

Such deaths can be prevented by testing for harmful gases before allowing anyone to enter a confined space, and at frequent intervals while he is in it.

A painter was killed in an explosion of paint thinner vapor in a 12,000-gallon tank he was spraying. Investigation revealed three possible sources of ignition: a broken, taped splice in a two-wire electric cord; spark in a vapor-proof light fixture with a gasket missing; and static spark from the sprayer and ungrounded tank.

Ventilate to make sure the atmosphere remains below 20 percent of the lower explosive limit.

Also make sure that electrical equipment is appropriate for the job.

A structural engineer, structural analyst, and construction worker died in a 30-foot shaft used for checking dam conditions. The first two, entering the shaft a day after a welder had worked there, collapsed. The third tried to rescue them. Air sample tests taken after the tragedy revealed a deficiency of oxygen and a high content of carbon dioxide and carbon monoxide.

Test the air in confined spaces before entry. Where necessary, either ventilate the space or have workers wear an air supplied respirator.

A sweeper in a raisin fumigating chamber became ill while working, and died some days later. The chamber had been ventilated after fumigation with methyl-bromide gas, but not tested for safe air before the sweeper entered.

Any space which is known to have contained a harmful gas should be air tested and found safe before anyone enters it without appropriate protection.

The Problems

There are two major problems involved in preventing injury or death to workers in confined spaces:

One is to keep workers from entering any place that may possibly be a confined space, until it is checked and found to be safe.

The other is to see that workers who must enter confined spaces are adequately protected in every way.

The Solution

The solution lies in observing California's Safety Orders containing specific requirements and recommendations for protecting workers in confined spaces.

Planning the Work

Test any area that may be at all likely to contain gases or vapors that are poisonous, flammable, asphyxiating, or irritating, or that may not contain enough oxygen.

An oxygen deficiency indicator or a miner's lamp will show whether there is enough oxygen.

A carbon monoxide tester will show whether there is a harmful amount of carbon monoxide.

A combustible gas indicator will show whether there are explosive gases or vapors, most of which are toxic as well.

Also available are devices that will measure non-explosive toxic gases and vapors.

It is best, of course, to purge all confined spaces of hazardous gases and vapors, but this is not always possible or practical. In such cases, both employers and employees should know and observe the safety precautions to be taken.

A work area which cannot be completely isolated from a process that may release harmful gases, must be treated as if it actually contained them.

Some EMPLOYER Responsibilities

Employers are required by Safety Orders to take specific measures for protecting workers in confined spaces.

Before allowing workers to enter confined spaces, make sure they understand the hazards of the job, what they can expect, and what they must do.

If there are pipelines that might carry gas or other hazardous substances to a confined space, *either* disconnect the lines *or* use some positive means of preventing the hazardous material from entering the confined space.

If the confined space recently contained a substance that could produce hazardous gases or vapors because of the work to be done in it, *either* provide (and enforce the use of) approved respiratory protection, *or* supply sufficient ventilation to assure that the air is safe to breathe.

If a confined space is tested and found to be gas free, but is likely to become gassy, provide an air supplied respirator and an approved safety belt with lifeline for the employee who is to enter the space.

Make sure that only *approved* protective devices are used.

If entry into a confined space is through a *top opening*, provide a harness type safety belt that will suspend the worker in an upright position, and secure the other end of the line on the *outside* of the entrance.

Station at least one standby worker outside the entrance for emergency. If entry is through a top opening, *have at least one more man within sight and hearing of the standby worker.*

In a confined space where a man wearing a respirator would be in peril if the respirator failed, don't let him work alone. *Have at least two men with respiratory equipment on the job—in addition to workers operating blowers or acting as standbys.*

If respiratory equipment is used, have at least one man on hand who is expert in giving artificial respiration if needed.

Provide *adequate* means of easy entrance and exit from confined spaces. Don't allow the entrance to be blocked with a blower or rigid vent pipe; such blocking has caused deaths in the past, by preventing a means of escape.

If a source of ignition is used inside a confined space where flammable gases may be present or formed, have at least one worker stand by on the outside prepared to give immediate assistance if needed. In addition, have the concentrations measured frequently, and remove the source of ignition if the concentration of flammable vapor is greater than 20 percent of the lower explosive limit.

Provide personal protective equipment whenever needed, such as in tanks which have last contained poisonous substances that can be absorbed through the skin.

Don't allow workers without self-contained breathing apparatus or hose mask to enter areas where the oxygen content is less than 19½ percent by volume.

Some EMPLOYEE Responsibilities

Make sure you clearly understand any and all hazards of a confined space before you enter it.

Follow directions for working safely.

Observe all safe work practices.

If a standby is at the entrance for help in an emergency, check from time to time that he is within sight and hearing.

Check that the respirators issued to you are in good operating condition before using them, and make sure that they fit your face perfectly.

Use the protective equipment and devices issued to you.

Don't take any source of ignition into confined spaces without written permission of the safety engineer or plant fire chief.

Don't do any "hot work" in confined spaces that last contained oils, solvents, or other hazardous liquids, even if tested safe, *unless adequate ventilation is provided.*

Don't use volatile solvents or oils in confined spaces unless there is adequate ventilation to maintain the atmosphere below 20 percent of the lower explosive limit.

Some solvent vapors even below 20 percent of the lower explosive limit are immediately hazardous to life. In such cases, proper respiratory equipment must be selected, unless it is practical to provide adequate ventilation to meet health standards.

The Job Hazards

Safety requirements for confined spaces are contained in the *General Industry Safety Orders*.

These hazards vary according to the particular work to be done.

Both employers and employees should thoroughly understand the hazards of confined spaces, especially of jobs in their own field.

Artificial Respiration

Workers who work in or around confined spaces—even if only occasionally—should know how to give artificial respiration, especially the latest mouth-to-mouth method.

To Sum Up

A sane person would not venture unprotected into a jungle—and confined spaces are much more hazardous than any jungle.

Remember that, and don't gamble with death in confined spaces!

Silver-Cadmium Solder Hazard...

State and federal agencies have issued a warning of the hazard in the use of any silver solder that contains cadmium.

At least three deaths from cadmium fume inhalation and poisoning have occurred in this country in the past several months.

On investigating the death of a welder in Bakersfield, the DIVISION OF INDUSTRIAL SAFETY found that he had been using a silver solder containing cadmium, and that there had been no local exhaust ventilation on the job.

After several hours of brazing with the silver-cadmium alloy, the worker felt ill, but decided to finish his shift. Even after developing acute respiratory symptoms, including coughing, chest pains, and a fever, he did not at once visit a doctor, having mistaken the symptoms for "welder's fever," an illness common among welders.

He did not know that he had been exposed to cadmium fumes, and that cadmium poisoning should be promptly treated.

Even *one* exposure to cadmium fumes may cause severe lung irritation, which may be fatal. However, most cadmium fume poisoning is caused by concentrations that do *not* produce warning symptoms of irritation.

Continued exposure to lower levels of cadmium in air may cause serious lung trouble, among other things.

A person definitely exposed to dense cadmium oxide fumes, or who, after possible exposure, shows symptoms such as coughing, tightness of the chest, or difficulty in breathing, should be placed under medical care and the physician notified of the suspected cause of illness.

Precautions to Be Observed

Requirements that must be observed when cadmium is used in industry are contained in the *General Industry Safety Orders*.

4188(a). Wherever cadmium or cadmium-coated articles are welded, burned or otherwise heated to such a degree that fumes of the metal are generated in hazardous amounts, the work shall be performed in an exhausted booth so arranged and ventilated that the workman performing the operation

is not exposed to hazardous concentrations of fumes; or the workmen performing the operation shall be protected by respiratory equipment approved for use in cadmium fumes.

If respiratory equipment is used to protect workmen performing the operation, either:

1. Ventilation shall be provided sufficient to prevent escape of harmful quantities of the fumes into the workroom; *or*
2. The operation shall be isolated; *or*
3. The work shall be performed out-doors, in such location that fumes will not enter any building in harmful quantities.

(b) Cadmium, cadmium-coated articles and cadmium compounds shall not be allowed in any cooking or eating-room; and eating or cooking shall not be allowed where such articles are present. Men who handle cadmium or cadmium-coated articles should wash their hands thoroughly before eating or smoking.

The Orders also say:

4205. No employer shall require any employee to process by the application of heat any object plated with cadmium unless the object or container in which it is first received is labeled:

WARNING!

**This Object is Plated With Cadmium
Do Not Burn, Weld or Heat Without
Providing Adequate Ventilation
Burning, Welding or Heating of Cadmium
Produces Poisonous Vapor**

Or labeled with other equivalent wording.

Low Pressure Boiler Failure Indicates Need for Additional Safety Regulation

The explosion of a cast-iron low pressure steam-heating boiler at a motel restaurant in Sacramento in March again demonstrated the high energy contained in comparatively small boilers.

Two men who were preparing the evening meal were killed, and the boiler room, kitchen, and air-conditioning room were completely demolished.

One boiler piece, weighing 120 pounds, was blown over the adjoining medical building, to land 250 feet away.

It took days to clear the rubble, because of debris and equipment hanging precariously overhead.

Engineers from the DIVISION OF INDUSTRIAL SAFETY investigated the acci-

dent to try to determine the cause, but the safety valve and much of the control system were so badly damaged that few definite conclusions could be reached.

The explosion appeared to result from overpressure, since the low water cutoff float had collapsed, indicating a pressure in excess of 60 pounds per square inch. It also appeared that the safety valve had not opened. No reason could be found for the gas valve staying open.

Since the accident, two similar boiler installations in the motel wings have each been equipped with a safety fuel shutoff valve, in addition to the normal operating fuel valve. This safety shut-

off valve is in series with the operating valve, and can be opened only if all safety controls are in order.

The new restaurant boiler will be so equipped also.

A requirement making secondary protection in the form of a safety fuel shutoff valve mandatory will be recommended in the proposed revision of the Boiler and Fired Pressure Vessel Safety Orders.

The additional valve, properly maintained, would further reduce the possibility of disastrous explosions, although these are few and far between, considering the enormous number of low pressure boilers in California and the tremendous energy in each one.

—From Department of Industrial Relations May 1966 Report to Governor's Council

Lumber Industry Trims Injury-Frequency Rate

By MAURICE I. GERSHENSON

Chief, Division of Labor Statistics and Research

Despite additional hazards arising from extensive mopping-up operations after the severe floods in northern California late in 1964, the injury-frequency rate in California's lumber and wood products industry dropped in 1965 to a new low—45.6 disabling work injuries per million manhours.

This compares with 48.2 in 1964, and 74.9 in 1950.

Historically, lumber and wood products manufacture has been an industry with a high rate of injury. Employers and employees in the industry in California may therefore take legitimate pride in the fact that the injury-frequency rate has been reduced roughly 40 percent in the past 15 years.

In that time, the job injury rate for all California industry as a whole declined 23 percent.

The 5 percent injury rate reduction in the lumber and wood products industry from 1964 to 1965 came at a time when it appeared that the declining trend had halted. In fact, in the period between 1961 and 1964, the injury-frequency rate of the lumber industry actually *increased* by a very slight amount.

A review of the month-by-month experience of the lumber and wood products industry for 1965 indicates that the injury rate decline last year may be attributed to successful accident prevention efforts, rather than to the temporary curtailment of logging and sawmill activities as an aftermath of the severe winter storms of 1964.

In March, there was a general resumption of operations in the industry. The injury-frequency rate for most months in 1965 was below that for the corresponding months in 1964.

Furthermore, there were no major work stoppages in the industry in 1964 or 1965 which might tend to distort the comparison of the injury rates in those two years.

Contrary to California's experience, the injury-frequency rate for the lumber and wood products industry for the nation as a whole increased in 1965.

Total Injuries

Last year, disabling work injuries in the lumber and wood products industry in California numbered 4,932—the first time on record that the number was less than 5,000.

If the 1965 job injury rate had been the same as in 1950, we would have had about 8,100 disabling injuries last year.

We can therefore say that, compared with 15 years ago, the lumber and wood products industry prevented some 3,175 serious injuries in 1965 alone.

If we make the same calculation for the entire period since 1950, more than 32,600 lost-time injuries were



prevented in the years 1951 through 1965.

Every major segment of the lumber and wood products industry, except planing mills and miscellaneous wood products plants, reported fewer injuries in 1965 than in 1964, as Table 2 reveals.

On-the-Job Deaths

In 1965 there were 29 work deaths in California's lumber and wood products industry, a sizeable reduction from the 41 recorded in 1964.

This is because work deaths in logging dropped from 31 to 19.

The number of fatal accidents in sawmills remained the same in both years—6.

Since 1950 the number of logging fatalities in California has been more than cut in half.

The 19 logging deaths in 1965 compare with 45 recorded 15 years earlier.

Only a few types of accidents were responsible for most of the logging deaths: falling trees, logs rolling down slopes, logs rolling from trucks in loading and unloading, and tractors or log trucks overturning.

Quite a drop was registered last year in the number of workers killed by falling trees—5 in 1965, compared with 11 in 1964.

Overturned tractors accounted for one fatality in the woods in 1965, down from three in 1964.

The number of truck drivers crushed beneath rolling logs while loading or unloading trucks also dropped to one from three.

In both 1964 and 1965, six workers lost their lives when crushed beneath rolling logs on downslopes.

Table 1

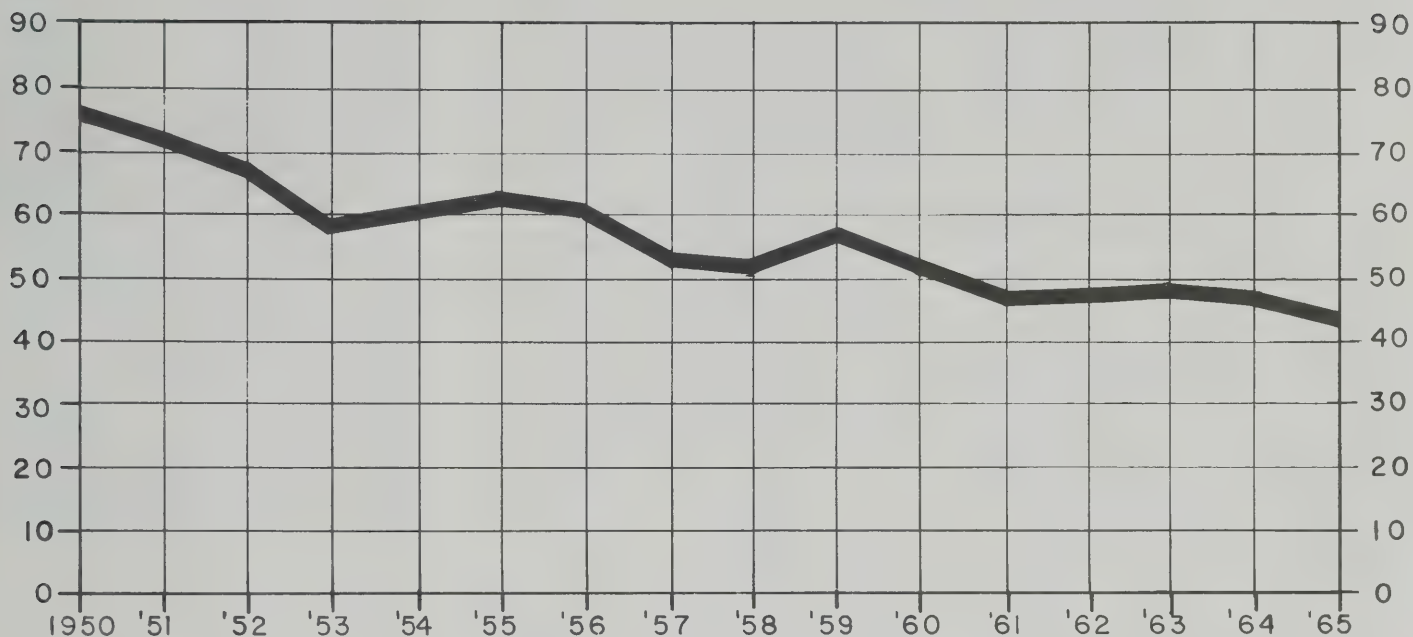
LUMBER AND WOOD PRODUCTS INDUSTRY

Disabling Work Injuries and Injury Frequency Rates California, 1950–1965

Year	Number of Injuries	Injuries Per Million Manhours
1950	8,017	74.9
1951	8,602	71.1
1952	8,055	67.2
1953	7,134	59.8
1954	6,977	60.5
1955	8,084	62.6
1956	7,495	60.0
1957	5,784	52.9
1958	5,478	50.7
1959	7,150	58.5
1960	5,684	51.1
1961	5,011	47.7
1962	5,158	48.4
1963	5,278	49.3
1964	5,375	48.2
1965	4,932	45.6

DISABLING WORK INJURIES PER MILLION MANHOURS LUMBER AND WOOD PRODUCTS INDUSTRY CALIFORNIA, 1950-64

Frequency
Rate



Leading Accident Types

Although the number of nonfatal disabling injuries in the lumber industry has declined since 1950, three types of accidents, *struck by or striking against objects, falls, and accidents involving strain or overexertion* continued in 1965 to account for nearly three-fourths of all lost-time

work injuries in the lumber and wood products industry.

(This is the same proportion as has existed in California industry generally for a score of years.)

Accidents in which the worker either struck against or was struck by an object led all others in producing job injuries in both 1950 and 1965,

accounting for more than a third of the lumber and wood products injuries in those years.

In the years since 1950, accidents involving strain or overexertion have replaced falls as the second leading source of nonfatal disabling injuries in logging and sawmills (and also in industry generally).

Accidents involving strain or overexertion accounted for 22½ percent of the disabling injuries in the lumber industry in 1965, up from 16 percent in 1950.

Falls, on the other hand, caused only 15 percent of such injuries in 1965, compared with 21 percent fifteen years earlier.

Summary

It is gratifying to be able to report that in 1965 the lumber industry injury rate, like the rates of many other California industries, dropped off the plateau upon which it had rested in recent years.

We hope this means that we are witnessing a resumption of the injury rate downward trend that was so pronounced in the lumber industry in the early 1950's.

Table 2
LUMBER AND WOOD PRODUCTS INDUSTRY
Disabling Work Injuries and Deaths
California, 1964 and 1965

	Work Injuries		Work Deaths	
	1964	1965	1964	1965
Total	5,375	4,932	41	29
Logging.....	1,320	1,204	31	19
Sawmills.....	1,800	1,655	6	6
Planing mills.....	504	535	1	1
Box factories.....	263	215	--	--
Plywood and veneer plants.....	484	372	1	--
Millwork.....	613	492	--	3
Cooperage.....	2	10	--	--
Miscellaneous wood products.....	389	449	2	--

The Role of the Administrator in Hospital Safety

[Joseph P. Zem, administrator of St. Luke's Hospital, San Francisco, has earned an enviable reputation in his field, where he is recognized as a leading hospital administrator who has convincingly demonstrated that safety and savings go hand in hand.

With hospitals becoming bigger business than ever, and likely to expand still further because of the Medicare program, Mr. Zem's remarks at a recent meeting are most timely.—Ed.]

The administrator must make the decision that a good safety program is not only essential but is an absolute necessity.

Once having made that decision, he himself must take the lead in setting up the program and making sure it works.

Let's explore the arguments which we can use to assist the administrator in reaching a decision as to whether it is necessary to bother with a safety program.

Let us start with the arguments *against* it.

You will hear these statements:

"I just don't have the time! I must spend my time on those things which are most important, those things which are *tangible* in terms of dollars, cutting costs, budgets, approval of purchases, manhour analysis, fund raising, and such.

"Of course, I don't want our employees getting hurt, but there's not much I can do about it if they're careless; it's a fact of life, so why waste time on it. The only one who worries about it is the insurance company, which is reluctant to pay out claims but is happy to get our premiums. Let *them* worry about it; that's what they're paid for!"

What about the arguments *for* a good safety program?

The best one I know is that "*If you don't like money, forget it!*"

One anti-safety program administrator will pore over budgets to trim costs. It requires a week of intensive persuasion and study to get authorization for a \$100 piece of equipment. Every means known to mankind is

devised to obtain the services of half an employee in the dietary department. I.B.M. reports of manhour analysis catch every hour of non-productive time.

But will he spend ten minutes each day, plus one hour each month, to save his institution some real money?

Let me give you an example of real money savings.

As most of you know, the workmen's compensation insurance rate paid on your employees depends on more than one factor.

The California Rating Bureau Manual's insurance rate for hospital employees in California is based on the loss experience of all hospital workers in the State, plus a standard overhead charge for insurance carriers.

This is the starting point.

The experience rate modification, a percentage of the Manual's rate, is derived by determining the individual institution's experience in comparison with that of hospitals as a whole.

Now, what does this mean in terms of dollars?

In 1964 the minimum rate for hospitals was \$1.74 per \$100 of payroll. Of 273 hospitals in the California Hospital Association program, the lowest experience rate was 66% of the hospital rate, or \$1.15 per \$100 of payroll. The highest experience rate was 166% of the hospital rate, or \$2.88.

In my hospital, which has a yearly payroll of \$3,500,000, the difference between the premiums I would pay at the lowest rate (which I have had in five out of the last seven years) and



the highest rate is \$60,550—the difference between \$100,800 per year and \$40,250 per year.

Now if \$60,550 a year that can be saved through an administrator's attention isn't worth a little of his time, he does not deserve the job or the pay that comes with it.

The trouble with most hospital administrators in this regard is that they consider the annual announcement of a raise in their compensation insurance rate as the equivalent of government increasing their taxes, and something they can do very little about.

But there are quite a few administrators who "like" money and hate to just give it away.

Now that I have attracted your attention with the word "money," let us give a couple of more reasons why the administrator should set up a *good* safety program.

1. You will have better morale among your employees and, as a result, better job performance.

2. Replacing a temporarily injured employee is a costly item in terms of salaries, training, and ineptness on a new job, not to mention the likelihood of recruiting an only semi-adequate replacement in the first place.

There are many other reasons, but by now I hope I have made my point.

At any rate, let us say we have attracted the administrator's attention. He says: "I want a hospital safety program but how do you go about getting it? It sounds extremely tough. Help me to get started."

It is *not* too difficult to get started, if the desire and the will to have the program exist.

The administrator should appoint a safety committee, with *himself* as its chairman. Then the number of members who miss meetings will be held to a minimum. In addition, as chairman, he can assign the leg work to special subcommittees.

This committee must set the objectives, develop an organization to arrive at the objectives, provide for reporting and review of injuries and accidents, and from time to time evaluate the entire program.

This of course is general. Let me be specific. I will tell you about our program and how it works.

First, I appointed to our Safety Committee the department heads who are responsible for the greatest number of employees and, therefore, the greatest number of risks.

They included our Director of Nurses, the General Maintenance Manager (who is responsible for housekeeping, laundry, building and equipment maintenance, and power plant), the Food Service Manager, and our Comptroller.

We met to assess the problem and set our objectives, which turned out to be quite simple.

"Reduce injuries to *zero*." You will note that I did *not* say "Reduce injuries to a bare minimum." That isn't good enough.

Now how did we go about setting up the program?

We agreed that the program should be composed of two basic parts.

The first part is a pre-employment and annual physical examination for

every employee—examination by a physician paid by the hospital to do it, and the physical to be as complete and worthy as that given to an astronaut.

This physical examination is necessary to determine *whether* the prospective employee is physically capable of doing the job (for which he is being employed) on a continuing basis for the foreseeable future.

If the employee needs to be under medical care or has a defect that can be repaired, he is generally not employed until he is cured.

Remember that once you have hired him, you take responsibility for the *aggravation* of any condition that an employee may have.

If he has a hernia and it ruptures, you will pay for it. If he has a bad back, and it begins to hurt, you will pay for it. If he is a T.B. case, and the condition becomes worse, you will pay for it. So, you should *know* his physical condition.

I am *not* saying that we do not employ people who are handicapped. We have had the blind in our X-ray dark room, and another handicapped worker in our Medical Library.

I *am* saying that we do not employ people whose physical condition is such that they cannot do the job for which they are to be employed on a continuing basis. They are the people who will be most susceptible to injuries when they tire and weaken. In addition, they are off sick most often; and besides that, I would prefer not to kill them in their work.

In our annual physical examination, any employee who is found to be in need of treatment must see his personal physician, and *he is not allowed to resume work without a letter from the doctor stating he is under treatment*.

If his condition is such that staying in his present position will jeopardize his health, an attempt is made to transfer him to a less strenuous job.

So we start with an employee who is physically capable of doing the job. We know he will remain on the job, short of an emergency or an acute illness. The others with whom he works are in the same category, so they are not holding one another up nor do they need to hold up walls to stay vertical.

Now to the second part of the safety program.

How do we get the message across to *everyone*?

Not just to the department heads, but to the guy who swings the mop, the butcher with a knife aimed at his left thumb, the carpenter with the high speed skill saw, the chief dietitian, the nurse on the unit, and the guy walking down the stairs with his vision obstructed by the load he is carrying.

We called our first meeting with the department heads of the hospital. We discussed our objectives, the program we were installing, the reporting system for injuries, the review of injuries by the committee, and the fact that I, as the administrator, from that day forward would hold *each* and *every* department head *personally* responsible for every injury that occurred in his department; and, further, that each and every *department head* would have to appear before the Safety Committee to explain to them *where* they have failed and *how* their failure resulted in an injury.

We instituted a report form which must be completed by the department head within 24 hours of the accident and returned to my office. It asks the department head several piercing questions, such as:

"What happened?"

"What was the cause?"

"Who was responsible?"

"What needs to be done to prevent recurrence?"

And last, that nasty question, "*Was it done?*"

This may make some department heads feel that the committee is a little tough on them; for as they represent the majority of the employees, they don't relish being questioned by other committee members.

In addition, the safety officer for the next month may be the head of the department with the highest injury rate.

Kind of sneaky—but effective!

The next step was to orient the sub-department heads, such as laundry manager, head nurses, chef, head maid, head orderly, and others, in much the same fashion. They would be expected to complete a report of any injury to an employee under their direct supervision.

Next we met with the employees themselves. With them we felt that the approach must be different.

We again go back to that all-important purchaser of commodities, money.

We developed charts which showed the comparison between the amount of disability pay the employee would receive if injured, and his regular salary. We asked them if they could maintain their families on disability pay, and, if so, for how long.

It is amazing how many thought that their full salaries would be maintained for as long as they were disabled, even if permanently. The facts made them gasp.

We showed them films on safety lifting techniques and fire fighting, all the while emphasizing that in addition to hurting physically, they would be hurt *financially* if injured.

Once our people were trained, the program went into effect.

Each employee who is injured reports for care to the emergency room, where a short report of the injury is prepared.

This report is sent immediately to me—generally, within minutes of the accident. If immediate action is

needed, I take time to initiate that action. If immediate action is *not* needed, an injury form, a standard employer's report of injury, is completed for me. A copy of the report is sent to the Safety Committee.

This takes less than five minutes time for each injury. The Safety Committee members make an analysis of what happened and why. Each month the committee meets for about an hour. It interviews department heads, analyzes accidents, and conducts a safety inspection of selected departments.

Attention is paid to small details, for as a rule the big things are pretty obvious and are corrected immediately.

This, in essence, is our program.

Does it work?

It works!

In five of the last seven years we have had the lowest experience rate for hospitals in California, if not in the nation. This means that both the hospital and our employees have profited.

I like money, and saved \$59,500 last year because of our safety program.

Why not try it?

Speakers at N.S. Congress



Geo. A. Sherman
Chief, Division of Industrial Safety

Ernest B. Webb, Director of the DEPARTMENT OF INDUSTRIAL RELATIONS, and Geo. A. Sherman, Chief of the DIVISION OF INDUSTRIAL SAFETY, will speak at the National Safety Congress and Exposition in Chicago this coming October.

Webb, whose picture and editorial appear on page 2, will describe *State Perspective and Policy* in a panel discussion on *What We Now Do for Industrial Safety*, at the Pick-Congress Hotel, on Wednesday afternoon, October 26th.

Sherman will speak on *Electrical Work Injuries*, during the Electrical Equipment Section Meeting at the Conrad Hilton Hotel on Monday afternoon, October 24th.

THREE-MONTH BOX SCORE

Disabling Work Injuries and Deaths in California

Month	Disabling Work Injuries ^a			Deaths		
	1966	1965	1964	1966	1965	1964
January -----	16,448	14,403	14,534	65	73	63
February -----	13,601	14,156	13,911	55	42	60
March -----	16,073	15,860	16,066	59	48	56
3-month total -----	46,122	44,419	44,511	179	163	179

Injuries up 3.8% from 1965

Employment up 4.8% from 1965

^a Disability causing absence from work for a full day or shift beyond the day of the injury.

(Source: Division of Labor Statistics and Research)

Facts on Hospital Injuries

As a supplement to Mr. Zem's remarks, we publish some interesting tables prepared by the DIVISION OF LABOR STATISTICS AND RESEARCH on injuries to workers in private and public hospitals in California. (State and Federal hospital workers are not included.)

The figures reveal that five out of every ten injuries to private and public hospital workers consist of strains, sprains, dislocations, or hernias.

It suggests the need for training workers in safe techniques of lifting, moving, or assisting patients.

In some State hospitals, hydraulic lifters are being used to lift heavy patients; and these "patient lifters" have in one or two wards virtually eliminated back injuries to workers.

Falls are another major source of injuries to hospital workers, causing one out of every five injuries.

A study some years ago showed that two out of three falls in hospitals occur on floors, stairs, or steps—which often are wet or freshly waxed.

With tests showing that slipping hazards are 2 to 10 times greater on wet floors than on dry ones, the remedy is obvious.

Spills should be cleaned up *immediately*.

Areas being mopped or waxed should be blocked off if possible; if not, warning signs should be posted. Cement, quarry tile, and terrazzo floors should be damp mopped, instead of hosed and squeegeed.

Disabling Injuries^a to Workers in Private and Public Hospitals California, 1953-1964

Year	Total	Private	Public
1953	1,883	952	931
1954	2,051	1,036	1,015
1955	2,203	1,137	1,066
1956	2,383	1,228	1,155
1957	2,772	1,498	1,274
1958	3,079	1,672	1,407
1959	3,237	1,740	1,497
1960	3,314	1,801	1,513
1961	3,360	1,864	1,496
1962	3,514	2,025	1,489
1963	3,693	2,090	1,603
1964	3,775	2,145	1,630

^a Disability causing absence from work for a full day or shift beyond the day of the injury.



A. C. "Bert" Presley of Unigas Inc., Sacramento, receives Western LP-Gas Industry *Distinguished Service Award* for his outstanding contribution to safety in California's LP-Gas industry during the past 25 to 30 years.

His many services include assistance in revisions of the LP-Gas Safety Orders.

Presenting the award is Arthur I. Snyder, Supervising Engineer of the DIVISION OF INDUSTRIAL SAFETY's Pressure Vessel Section.

The ceremony took place at the 17th annual Western Liquid Gas Association meeting in Anaheim on April 2nd.

Letters to the Editor...

The CALIFORNIA SAFETY NEWS has, in each issue, proven a very valuable help in our institution safety training program.

—Paul J. McKusick, Superintendent
Department of Youth Authority, Sacramento

Our compliments on what is obviously a very comprehensive state safety program.

—William F. Mathews, Safety Engineer
Hercules Powder Co., Cumberland, Md.

We have found the [CALIFORNIA SAFETY NEWS] article very helpful in regard to assisting our clients with their safety programs.

—C. Q. Brady & Co., Los Angeles

This publication [CALIFORNIA SAFETY NEWS] has proved to be of great use to the many professors and students to whom our center is available.

—W. Richard Bigger, Director
Public Adm. Center, San Diego State College

Disabling Injuries^a to Workers In Private and Public Hospitals, California 1964

NATURE OF INJURY	Total	Private	Public
Total	3,775	2,145	1,630
Strains, sprains, dislocations, hernias	1,837	1,034	803
Cuts, lacerations, punctures, abrasions	408	235	173
Bruises and contusions	404	206	198
Occupational diseases	208	106	102
Fractures	193	116	77
Burns and scalds	167	108	59
Crushing injuries	64	44	20
Eye injuries	56	29	27
Amputations, loss of use of	8	7	1
Other injuries	66	38	28
Nature not reported	364	222	142
ACCIDENT TYPE			
Total	3,775	2,145	1,630
Strain or overexertion	1,506	847	659
Struck by or striking against	846	482	364
Fall or slip	771	452	319
Inhalation, absorption, ingestion	204	102	102
Caught in or between	149	89	60
Contact with temperature extreme	138	88	50
Foreign substance in eye	49	26	23
Accident involving moving motor vehicle	30	11	19
Explosion, flareback, etc.	11	7	4
Contact with electric current	6	3	3
Accident type not reported	65	38	27

^a Disability causing absence from work for a full day or shift beyond the day of the injury.

Recent Convictions for Violations of Safety Orders

Tbelbert Francis, Jerry Collam, Richard Veuhoff, Perris Enterprises, Inc., doing business as Imperial Plastering Company, Riverside County, pleaded *nolo contendere** to the charge of furnishing and erecting unsafe scaffolding in Pomona on September 11th, 1965.

They were fined \$110 and placed on probation for three years.

Judge Roland J. Brownsberger rendered the verdict in Municipal Court, Pomona, on November 18th, 1965. Head Deputy District Attorney Fred Winchello prosecuted.

Sully Miller Contracting Company, of 3000 East South Street, Long Beach, was fined \$100 in the case involving a worker who died from burns when he passed a lighted butane torch across a half-filled can of gasoline on an open truck bed.

The gasoline ignited; and in trying to wrest the burning can from the truck bed, the worker spilled flaming gas all over himself. There was no fire extinguisher on the truck.

The company pleaded *nolo contendere** to violation of Labor Code Section 6402, which says: "No employer shall require, or permit any employee to go or be in any employment or place of employment which is not safe."

Judge Robert A. Weinke rendered the verdict in Municipal Court, South Gate, on November 18th, 1965.

Assistant District Attorney Harold M. Stanley prosecuted.

Edward D. Chancellor, a rig operator, of 1204 Wilson Avenue, Oildale, employed by Sierra Production Service, Bakersfield, pleaded guilty to allowing an oil well service mast to contact and rupture an overhead power line—a violation of Section 385 of the Penal Code.

He received a suspended jail sentence of 30 days.

Judge Frank Noriega rendered the verdict in Municipal Court, Bakersfield, on January 19th, 1966.

Assistant District Attorney R. W. Bradshaw prosecuted.

Three defendants pleaded *nolo contendere** to the absence of shoring in an 8½ foot deep trench that caved in on December 8th, 1965, to cover a workman up to his shoulders in earth. They were:

Merle R. McGuire, of M. R. McGuire Mechanical Contractors, Inc., 2036 Merced Street, South El Monte;

Alfred R. Kennedy, general superintendent, also of that address; and

Olin E. Hess, foreman, of 4428 Lovante Street, Long Beach.

Each of the three was fined \$29, and each received a five-day jail sentence, suspended on condition that there is no repetition of the offense for a six-month period.

Judge Roland C. Rutledge rendered the verdict on February 4th, 1966, in Municipal Court, Ontario.

Deputy District Attorney Joseph Burns prosecuted.

Western Pacific Roofing Company (John Zamrzla, president) of Bell Gardens, pleaded *nolo contendere** to the charge of violating Section 7156 of the Labor Code, which makes it a misdemeanor to knowingly or negligently furnish unsafe or improper mechanical contrivances.

It resulted in extremely serious injury on February 16th, 1966, to an

apprentice roofer, Henry Taylor, Jr., who fell 35 feet to the ground when a roofer's gallows frame, a standard steel tubular type "A" frame, was pulled over the edge of a roof.

(The accident and injury would not have occurred if the gallows "A" frame had been tied back on the roof of the building, as is required by Construction Safety Order 1727.)

Judge Lloyd S. Verry rendered the verdict on April 5th, 1966, in Municipal Court, Anaheim.

Assistant District Attorney Robert W. Schafer prosecuted.

Four defendants pleaded *nolo contendere** to the charge of allowing a truck crane to come in contact with a high voltage line, a violation of Section 385 of the Penal Code.

They were fined as follows, with all fines suspended on the condition that the defendants commit no similar violation through June 30th, 1966:

M. J. Bevanda Co., 6950 Tujunga Ave., North Hollywood, \$500.

J. H. Woolery, project superintendent, \$200.

John Carpenter and Fred Smith, equipment operators, \$100 each.

Judge Charles F. Stevens rendered the verdict in Municipal Court, Oceanside, on November 24th, 1965.

Deputy District Attorney Leonard F. Price prosecuted.

* "a plea by the defendant in a criminal prosecution that without admitting guilt subjects him to a judgment of conviction as in case of a plea of guilty but does not preclude him from denying the truth of the charges in a collateral proceeding."—Webster

FONTANA — In a precedent-setting decision, Fontana Justice Court Judge Milton E. Milleman has held a job foreman responsible for the failure of employees to follow company safety directives.

Louis Julian, a foreman of Lundeen Coating Corp., Los Angeles, pleaded "no contest" to the charge he failed to require the use of safety belts as specified by the state labor code at Kaiser Steel Corp., Fontana.

Julian was foreman of a Lundeen paint crew last January 15

when Robert Burrows, a Lundeen painter, fell off a bridge crane from which he was painting a ceiling at the Kaiser plant.

He was not wearing a safety belt as required by the labor code and Lundeen policy.

Judge Milleman sentenced Julian to pay a \$1,110 fine and serve 180 days in jail but the sentence was suspended partially with Julian to pay \$550 within 10 days and be on one year's probation.

Julian paid the \$550 and was placed on probation.

—From the February 15th, 1966, issue of *The Daily Enterprise*, Riverside, California

Yours for the Asking

To those interested in accident prevention in industry, a number of publications of the DIVISION OF INDUSTRIAL SAFETY will be of value.

They are yours for the asking—free!

For obvious reasons, we do not send more than three complimentary copies of any brochure to anyone outside the State.

Bulletin 103, "Safe Handling of LP-Gas," gives the use and characteristics of LP-Gas, and the rules and standards that govern safe handling.

Bulletin 104, "Ground It!" explains the necessity and wisdom of grounding electrical hand tools.

Bulletin 106, "Ladders on the Farm," gives ladder pointers which, if followed, will reduce the high rate of disabling injuries caused by poor farm ladders and improper use of sound ladders.

Bulletin 107, "The Ship-Shape Shop," shows how good housekeeping and maintenance will save lives, limbs, and money.

Bulletin 108, "Taming the Circular Saw," deals with a most useful but dangerous wood-working tool.

Bulletin 110, "Tips for Hotel Workers," shows that hotel worker accidents are easily prevented if a few simple tips are followed.

Bulletin 111, "Farm Safety Check List," is a safety guide for everyone on the farm.

Bulletin 117, "Stop Grinding Out Injuries!" is about the abrasive wheel, and gives pointers which, if observed, will eliminate almost all grinding wheel injuries—of which over half are eye injuries.

Bulletin 120, "Safety Rules for Painters," tells you the four things that cause four out of five injuries to painters, and shows you how to prevent such injuries.

Bulletin 122, "Handy Rules for Hand Tools," describes the proper care and use of such tools as files, screwdrivers, wrenches, chisels, hammers, knives, and handsaws.

Bulletin 125, "Are You Using Carbon Tet?" deals with a chemical that has caused work injuries and deaths.

Bulletin 127, "Look Out for Yourself If You Are Around Crop Spraying," an illustrated booklet directed to the farm worker himself, explains how pesticides can be used safely. (Available in Spanish also.)

Bulletin 128, "If You Work in a Quarry," is for the quarry and open pit mine worker, and points out the things he should keep in mind.

Bulletin 133, "Analysis of California Logging and Sawmill Fatalities," contains a study of logging and sawmill deaths in California, and an injury-prevention program.

Bulletin 137, "Skin Trouble Is Plenty Trouble," deals with the most common disease you can get at work.

Bulletin 138, "Supervision and Explosives Accidents," analyzes explosives injuries in California in a three-year period.

Bulletin 140, "Keep AWAY From Power Lines!" is for any and all workers whose jobs may expose them to the hazards of overhead electric power lines.

Bulletin 141, "Power Hand Saw Safety," gives common causes of power hand saw injuries, and tells how to stop them.

Bulletin 142, "Read and Understand the Label!" reminds us how vitally important it is to read and understand the labels of containers of hazardous chemicals and mixtures.

Bulletin 143, "Trade Association Safety Programs," shows the value of such programs and what they can do for you.

Bulletin 144, "The Know-How of Wire Rope Safety," gives information that the man on the job and his boss should know.

Bulletin 150, "Electrical Safety and Swimming Pools," describes precautions that would make swimming pools safe electrically.

Bulletin 151, "Control of Noise in Industry," emphasizes the need for either eliminating or controlling excessive noise, and gives practical methods for doing so.

Bulletin 153, "Electrical Safety on the Farm," points out the many electrical hazards encountered on the farm, and tells how to guard against them.

Bulletin 154, "The Tailgate Safety Meeting," gives pointers on an effective means of promoting on-the-job safety.

Bulletin 155, "Pesticide Regulations," tells how to guard against hazards in the use of poisonous and toxic pesticides containing organic phosphates.

Guard Standards, No. 1, Materials and Construction, gives invaluable advice on constructing guards and selecting the right materials for them.

Guard Standards, No. 2, Stairways and Railings, gives requirements for stairways, railings, entrances to stairways, and floor and wall openings.

Form 634, an 8½" x 11" placard. Safety Responsibilities—Employer and Employee—prescribed in Labor Code. (Available in Spanish also.)

Available Reprints include

Power Press Safety

Transportation of Workers — Current California Regulations

Lifting With Safety (Limit within California: 100 copies for any organization, one copy for any individual)

Several construction bulletins, omitted from this list, are being amended in the light of the recently revised Construction Safety Orders.

Safety Orders Available at Documents Section

The following Safety Orders are available from Documents Section, P.O. Box 1612, Sacramento, California 95807.

Where Safety Orders have been revised (as almost all of them have been), the date is the date of the latest revision.

Money orders or checks made payable to the Documents Section must accompany all purchase orders. Don't send stamps.

Documents Section gives a 10% discount on purchases of 50 or more copies of any one title.

Don't forget to add 4% sales tax if you live in California.

	Price	With sales tax
Aerial Passenger Tramway Safety Orders (1956).....	\$0.50	\$0.52
Boiler and Fired Pressure Vessel Safety Orders (1955).....	.50	.52
Compressed Air Safety Orders (1946).....	.50	.52
Construction Safety Orders (1965) bound 4½" x 7½".....	1.50	1.56
in loose-leaf form 6" x 9".....	3.00	3.12
Electrical Safety Orders (1962).....	1.50	1.56
Elevator Safety Orders (1954).....	1.00	1.04
General Industry Safety Orders (1963).....	1.00	1.04
Logging and Sawmill Safety Orders (1958).....	1.00	1.04
Mine Safety Orders (1958).....	.75	.78
Petroleum Safety Orders—Drilling and Production (1959).....	1.00	1.04
Petroleum Safety Orders—Refining, Transportation and Handling (1951).....	.75	.78
Pneumatic Explosives Loading Safety Orders (1944), Quarry and Open Pit Mine Safety Orders (1953).....	.75	.78
Ship and Boat Building Safety Orders (1961).....	.50	.52
Tunnel Safety Orders (1962).....	.75	.78
Unfired Pressure Vessel Safety Orders (1964).....	.75	.78
Window Cleaning Safety Orders (1952).....	.50	.52

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Offices of the Division of Industrial Safety

The following is a list of main and field offices of the DIS.

MAIN OFFICES

SAN FRANCISCO	455 Golden Gate Ave.	557-1946
Los Angeles	3460 Wilshire Blvd.	381-5695

OTHER OFFICES

Bakersfield	225 Chester Ave.	324-6437
Chico	341 Broadway	343-5182
Eureka	619 Second St.	442-5748
Fresno	2550 Mariposa St.	268-7151
Long Beach	230 East 4th St.	432-8443
Merced	550 W. 22nd St.	723-4561
Oakland	1111 Jackson St.	834-3460
Redding	2115 Akard Ave.	241-5100
Sacramento	1107 Ninth St.	445-5818
Salinas	307 Soledad	424-4807
San Bernardino	478 West Base Line	884-6461
San Diego	1350 Front St.	232-4361
San Jose	888 North First St.	294-1525
Santa Ana	1619 W. 17th St.	547-1603
Santa Barbara	411 E. Canon Perdido	966-2918
Santa Rosa	750 Mendocino Ave.	542-8802
Stockton	31 E. Channel St.	466-3547
Ukiah	305 N. Main St.	462-8850
Ventura	3418 Loma Vista Road	642-9679



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Governor Brown's Inspiring Address Page 4

Three-Year Box Score of Work Injuries and Deaths Page 56

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Part of the large Conference attendance at the general assembly



Vol. 50, No. 1
March 1966

California Safety News

California Safety News

Vol. 50, No. 1, March 1966

The California Safety News is mailed free of charge to those interested in industrial safety

An Outstanding Safety Conference

Another outstandingly successful Governor's Industrial Safety Conference has come and gone, and the general opinion is that the 1966 two-day meeting in San Francisco was one of the finest in our history.

It was climaxed by an inspiring and illuminating address by Governor Edmund G. Brown.

The Governor had good news for the large luncheon throng that heard his speech—a decline in California's work injury rate in 1965 to the lowest level in our history, a truly notable accomplishment.

In congratulating those who took part in this commendable achievement, Governor Brown warned against any slackening in the drive to make California workplaces ever safer.

"We cannot afford to become complacent over what has been accomplished," he said, "for complacency is the enemy of progress, and an invitation to retrogression. Eternal vigilance is the price not only of liberty, but of greater safety in our factories, and farms and highways."

Mentioning "the inescapable responsibility that rests on management, labor and government" for greater work safety, Governor Brown expressed his confidence in management and labor in California.

"I know that both these vital elements of our economy will work closely together, *in even greater measure*, to further the expressed aim of this Conference: *to reduce work injuries and deaths in California, mainly through ever-increasing cooperation between labor and management.*"

It is a confidence I unreservedly share.

Ernest B. Webb



In This Issue...

For the full text of Governor Edmund G. Brown's informative and inspiring address at the Governor's Industrial Safety Conference, turn to page 4.

A Management View of On-the-Job Safety—"The Challenge of the Practice of Industrial Safety"—is given on page 8.

For an opinion of the value of what organized labor is doing about safety on the job, and proposals for effective joint labor-management safety committees, read **A Labor View of On-the-Job Safety**. Page 12.

DIVISION OF INDUSTRIAL SAFETY publications, designed primarily for supervisory personnel and instructors, are **Yours for the Asking**. Page 15.

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DEPARTMENT OF INDUSTRIAL RELATIONS

DIVISION OF INDUSTRIAL SAFETY

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ERNEST B. WEBB.....Director of Department

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Summary of the 1966 Conference . . .

One of the most successful two-day annual statewide meetings in the history of the Governor's Industrial Safety Conference!

Such was the virtually unanimous verdict of the 1,400 persons who attended the 16th annual Conference, held at the Fairmont Hotel, San Francisco, on February 3rd and 4th.

There was a wealth of praise for the caliber of the entire program—the general assembly; the separate section meetings on the afternoon of the first day and morning of the second; and the inspiring address by Governor Edmund G. Brown at the luncheon that climaxed the two-day proceedings.

For the full text of Governor Brown's speech, turn to the next page.

Ernest B. Webb, Director of the DEPARTMENT OF INDUSTRIAL RELATIONS was General Chairman of the Conference; George E. Sherman, Chief of the DIVISION OF INDUSTRIAL SAFETY, Conference Secretary and Program Chairman; and Michael Flagg, Supervisor of the DIVISION'S Educational Section, Conference Coordinator.

Featured speakers at the general assembly were Paul L. Wetcher, Manager of Labor Relations, C. F. Braun & Company, Alhambra, and W. L. Vinson, Vice President of the 9th District of the International Brotherhood of Electrical Workers.

Referring to "the state of safety today," Wetcher said that there is "sound basis for cautious optimism," with greater public awareness of hazards at work, on the highway, and at home.

He credited the safety program inaugurated by the U.S. Army Corps of Engineers in 1933 for its construction work with results that were so dramatic that both labor and management groups "*knew improvements were possible and that accidents were preventable.*"

By our attitude, he stated, we can determine how we practice safety.

"Will it be the simple mechanical repetition of a routine, or will it be the dedicated approach of the true professional?"

Vinson pointed out that California has an excellent industrial safety record compared with other states, "*but we can do better, and we should do better.*"

He urged greater effort on the part of both management and labor, "*not only singly, but jointly.*"

He emphasized that while the *legal* responsibility for maintaining a safe work place is management's, "*the moral responsibility for work safety belongs to us all.*"

Organized labor is keenly aware of that responsibility, he said, "*and the record shows it has not been remiss.*"

Stressing the importance of joint labor-management safety committees, he cited seven fundamentals for the success of such committees.

The speeches by Wetcher and Vinson appear elsewhere in this issue.

The programs of the following eight major industry-groupings that make up the Conference were on the whole excellent:

- Agriculture
- Construction
- Forest Products
- Governmental Agencies
- Manufacturing
- Mineral Industries
- Transportation, Communication, and Utilities



Geo. A. Sherman
Chief, Division of Industrial Safety
Conference Secretary

The colorful Conference exhibit attracted the usual large crowd, which selected thousands of copies of safety publications prepared by the DIVISION OF INDUSTRIAL SAFETY and the DIVISION OF LABOR STATISTICS AND RESEARCH.

Jack F. Hatton Reappointed

Last January, Governor Edmund G. Brown reappointed Jack F. Hatton of Inglewood to the Industrial Safety Board.

Hatton, Chief Safety Engineer of Lockheed Aircraft Corporation, Burbank, is the dean of the Board, having served on it since its very inception in 1945.

It is a notable record.

Past president of the Southern California Industrial Safety Society, and of the American Society of Safety Engineers, Hatton is one of the nation's most eminent safety figures.

His picture appears on page 14.

Our Thanks to the DLS&R

As always, no summary of the annual Conference would be complete without mention of the valuable statistical information provided by the DIVISION OF LABOR STATISTICS AND RESEARCH—not only at the two-day meeting, but to Conference Sections throughout the year.

Governor Edmund G. Brown's Inspiring Address at the Conference

This is the seventh time that I have been privileged as Governor to address you on the vital subject of industrial safety in the nation's leading state.

Two years ago, when we last met in this room, I emphasized the fact that California had solidified her position as this country's industrial dynamo. In 1966, that leadership has been extended, and we are continuing to set new records in every part of our economy.

The Record

Here is the record which all of you, in management and labor, have joined to build:

During the past five years, California has created new jobs at nearly twice the rate of growth of the nation as a whole. From the beginning of 1961 through 1965, we added almost one million new jobs—an increase of more than 15 percent.

Our 7 million wage earners have the highest pay scale in the nation. They enjoy the best working conditions and standards.

Last year, California's economy broke records in nearly every major category. The unemployment rate went down. New records were set in employment, personal income, cash farm receipts, corporate profits, retail trade. And that isn't all.

Last year, we passed the historic medicare bill, giving hundreds of thousands of our citizens greater security and dignity.

We opened two new campuses of the University of California, two new state colleges and authorized four additional state colleges.

We successfully launched a pioneering state effort in space age government. We are applying the techniques of the space scientists to some difficult down-to-earth problems in transportation, waste disposal, crime and law enforcement, and other fields.



And we embarked on the most extensive program of state beach and park property in California history.

The outlook for this year is even better. We expect our economy to create 230,000 new jobs—and this would bring the 1966 unemployment rate in California to a seven-year low.

PG&E has just published a prediction that employment will keep pace with population growth; that personal income will reach a new record level of \$63.3 billion; that homebuilding, retail sales will reach new highs.

Our program for the preservation of natural resources will continue unabated, too. ***And we are unreservedly committed to protecting the greatest of our resources—to which all other resources are subordinate—the men and women and children who make California their home.***

We persist in our efforts to make sure that they can live to enjoy the fruits of their labors.

With that in mind, we must continue to do all that is humanly possible to preserve the safety of our people in every field, both on and off the job.

Our Responsibility

Of course our primary concern at this conference is the safety of those who earn their daily bread in industry—the workers who have made California the most vigorous industrial leader in the nation.

I have repeatedly mentioned the inescapable responsibility that rests on management, labor and government to make our workplaces ever safer.

I am gratified that management in California has, by and large, shown a most commendable awareness and dedication to the safety of those they employ.

The overwhelming majority of employers has shown that they are *anxious* to maintain a safe place of

employment; that they *welcome* expert aid in that direction; and that they are *willing* to do whatever is necessary to achieve it.

I am gratified, too, that labor in California is, as always, firmly committed to the health and safety of all who work. The many and varied safety programs and safety courses that organized labor has instituted for its membership are tributes to its leaders.

I am proud of the leaders of these two great elements of our industry.

As for what government has done, the record speaks for itself.

When I last spoke to you, I told you that I had recommended to the Legislature an increased budget for the DIVISION OF INDUSTRIAL SAFETY. Of that increase, more than \$300,000 was for the DIVISION'S Construction Section.

This was because of the high injury rate in construction. In this industry, one out of every 12 workers was so seriously injured during the year that he could not return to work the following day.

As you know, the Legislature approved my request, and 22 additional safety engineers were added to the DIVISION OF INDUSTRIAL SAFETY'S Construction Section.

This increase in the Construction Section was a major step in the drive to reduce injuries in a great multibillion dollar California industry.

The second major step was the adoption of new, updated Construction Safety Orders.

The revised Orders now adequately cover not only old hazards, but hazards arising from new methods, new processes, and new machines introduced by new technologies.

I have already expressed my commendation of labor and management for the part they played in the new Orders.

I have likewise expressed my appreciation of the Industrial Safety

Board for adopting safety orders that provide the basis on which a sound safety structure can be erected.

Notable Accomplishments

Two years ago I pointed out that while there had been a substantial and most welcome decline in the *rate* of disabling work injuries in this state since 1950, the rate had been on a virtual plateau for three or four years.

I stated that the challenge directly faced every one of us—labor, management, government, and every other organization and individual concerned with work safety in California.

I urged that we redouble our efforts to drive the work injury rate downward once again.

Have we met that challenge?

The facts are heartening.

Based on data for the first nine months last year, the projected work injury rate for California industry as a whole should be about 31 disabling injuries per thousand workers.

This rate, which would be an all-time work-injury low for the state, compares favorably with the rate of 32.3 in 1964.

In other words, it looks as though the injury rate dropped a full 4 percent last year.

This would be a notable accomplishment, for two reasons. One is that we may have *finally*—and I hope *permanently*—knocked the injury curve off the plateau.

The other reason is this. Historically, an advance in the rate of *employment* is accompanied by a *greater* rise in the rate of *injuries*. Here, however, history has been reversed, for despite the *increase* in employment, the rate of injuries has *declined*.

This augurs well for the future.

In construction, which has furnished the major blot in our work injury picture, the figures are also most encouraging.

The injury rate in that industry appears to have declined appreciably in 1965.

In 1964, there were 82.9 disabling work injuries for every thousand construction workers. In 1965, if preliminary estimates are realized, the rate will be 76 injuries per thousand workers.

This would be a year-to-year decline of more than 8 percent which is indeed substantial.

Of course we have a long way to go before we can be even remotely satisfied with the construction injury rate. But we seem to have made at least a *step* in that right direction, and I hope that through our combined efforts further progress will be achieved.

I am also glad to report a small but welcome decline in deaths resulting from on-the-job injuries; from 726 deaths in 1964, to 710 deaths in 1965. This improvement occurred although we had more workers on California payrolls than ever before.

The safety accomplishments of industry last year are noteworthy. They are something of which we can all be proud. They are due largely to the efforts of you who are gathered here today.

You have not let any barriers, statistical or otherwise, discourage you from the task of surmounting a problem. For, as you have amply demonstrated, you possess the priceless ingredient—*the right attitude*—that is essential for success in any endeavor.

I congratulate you on achieving what we have so long attempted to achieve. I know that success will serve to encourage you to renewed and still more vigorous endeavors to further cut away *the blight of industry—the toll of injury and death*.

I know you will not slacken your pace in the drive to make our workplaces ever safer for our people.

We cannot afford to become complacent over what has been accomplished.

For complacency is the enemy of progress, and an invitation to retrogression. Eternal vigilance is the price not only of liberty, but of greater safety in our factories and farms and highways.

The Rehabilitation Program

Let me say a word here on our rehabilitation program for injured workers. Some day we may reach the industrial millennium when there will be an absolute, unavoidable minimum of deaths or injuries at work. Meanwhile, we must care for the needs of all who are injured on the job.

We have won passage of Assembly Bill 2023.

For the first time, vocational rehabilitation of the industrially injured is included as a benefit under Workmen's Compensation. These programs must be initiated by mutual agreement of the employer or the

insurance carrier and the injured worker.

We hope this excellent program will be used to the fullest degree.

In 1963, I asked the Legislature to create a Department of Rehabilitation within the Health and Welfare Agency.

That department already has made great progress in rehabilitating the injured worker. Its goal is to help the injured and handicapped to achieve gainful employment and useful lives.

This is the right philosophy. For while it is only right and proper that we care for those in need, *the best way we can help others is to help them help themselves.*

I know that enlightened management will continue to do all in its power to preserve the safety of workers. I know that enlightened management will go beyond the mere letter of the law in striving to ever improve the lot of those employed.

I know that enlightened labor will continue to expand its programs of safety education and instruction for its membership.

I know that both these vital elements of our economy will work closely together, *in even greater measure*, to further the expressed aim of this Conference: *to reduce work injuries and deaths in California, mainly through ever-increasing co-operation between labor and management.*

I know that the DEPARTMENT OF INDUSTRIAL RELATIONS under Ernie Webb, and its DIVISION OF INDUSTRIAL SAFETY under George Sherman, will continue the splendid work they are doing. They will leave no stone unturned to see that California workplaces and occupations are safe for our working men and women.

For myself, I personally pledge you the full powers of my office in the great and unending campaign in which we are all united.



Around the registration desks in the Fairmont Hotel lobby

Letters to the Editor...

In my opinion this [the CSN] is one of the finest publications I have received on safety and wish to compliment you on doing an exceptionally good job.

—R. C. Fischer, of R. C. Fischer & Co., Oakland

From time to time I have had the opportunity to read your publication CALIFORNIA SAFETY NEWS. I have found this publication to be informative and useful and thus would appreciate being placed on your mailing list.

—J. W. Peck, Chief Inspector of Mines
Dept. of Mines and Petroleum Resources
Victoria, B.C.

Each issue of your publication CALIFORNIA SAFETY NEWS is read from cover to cover and is greatly appreciated.

—Samuel T. Logan, Safety Engineer
Corps of Engineers, U.S. Army, Vicksburg, Miss.

A copy of CALIFORNIA SAFETY NEWS recently passed my desk and I found it most interesting. I would be most appreciative to have my name placed on the mailing list.

—Joseph H. Alleva
Chief Construction Safety Inspector
State of New York Department of Labor

Your journal [the CSN] is much appreciated by . . . members of the Institution of Works Managers.

—J. T. Martin, Executive Editor
India Publications Co., Bombay

Will you please include me in your mailing list for CALIFORNIA SAFETY NEWS. I read your December 1965 issue and was very impressed. I have been the Industrial Nurse here for seventeen years.

—Mary J. Baum, R.N.
Sunshine Biscuits, Inc., Oakland

May I compliment you on a fine magazine and worthy of all departments receiving a copy.

—H. C. Lawson, Chairman, Safety Committee
City of Fountain Valley

While attending the Governor's Industrial Safety Conference in San Francisco . . . I helped myself to a copy of CALIFORNIA SAFETY NEWS . . . and have found it to be an excellent publication.

—A. B. Ciezar, Lehigh Safety Shoe Co.

Through the years that I have received . . . [the CSN] from you, I have obtained much safety information that has helped me in my work in safety here in the state of Iowa.

—N. J. Wardle, Extension Agricultural Engineer
Iowa State University

If You Move—

If you move, and wish to continue receiving the CSN, please notify us of your new address.

As one of the many safety engineers who regularly receive CALIFORNIA SAFETY NEWS, I want you to know how much I appreciate receiving this fine publication.

—G. J. Wolnez, Plant Operations Safety Engineer
Aerojet-General Corporation

The CALIFORNIA SAFETY NEWS has, in each issue, proven a very valuable help in our instruction safety training program.

—Paul J. McKusick, Superintendent
Department of Youth Authority, Sacramento

I compliment you on the subject matter in these bulletins—[*If You Work in a Quarry and The Know How of Wire Rope Safety.*]

—Leslie S. Vollz, Safety Engineer
Consumers Co., Division of Vulcan Materials Co.

I have . . . read several issues of CALIFORNIA SAFETY NEWS and find it very useful and informative.

—John G. Sellers, Safety Engineer
Combustion Engineering, Inc., Windsor, Conn.

We feel that your CALIFORNIA SAFETY NEWS carries a great deal of instructive material and is fresh and interestingly presented.

—E. W. Tenscher, Safety Supervisor
Division of Highways

It is always a pleasure to have your CALIFORNIA SAFETY NEWS come across my desk. While some of the material may be local in nature, there is always a gem to be found that can be used even here on the East Coast.

—Thomas H. Appert, Director, Loss Prevention
Great American Insurance Co. of New York

Conference pictures in this issue are by

**Cristof Studio
Fairmont Hotel
San Francisco**

THREE-YEAR BOX SCORE Disabling Work Injuries^a and Deaths in California

Month	Disabling Work Injuries			Deaths		
	1965	1964	1963	1965	1964	1963
January-----	14,403	14,534	14,437	73	63	43
February-----	14,156	13,911	12,622	42	60	48
March-----	15,860	16,066	13,289	48	56	57
April-----	14,025	15,514	14,157	51	62	57
May-----	15,315	14,944	13,520	62	56	58
June-----	14,965	15,023	13,352	64	64	36
July-----	14,931	16,847	17,267	74	50	67
August-----	16,987	16,347	15,089	63	64	54
September-----	16,130	16,065	16,915	71	60	89
October-----	16,435	15,255	16,906	69	67	49
November-----	15,208	14,984	12,094	46	67	50
December-----	13,631	12,683	13,827	47	57	42
12-month total	182,046	182,173	173,475	710	726	650

Injuries practically unchanged from 1964

Employment up 3.1% from 1964

^a Disability causing absence from work for a full day or shift beyond the day of the injury.

(Source: Division of Labor Statistics and Research)

A Management View of On-the-Job Safety..



Paul L. Wetcher
Manager, Labor Relations
C. F. Braun & Company

It is my pleasure to represent the National Constructors Association of Washington, D.C., and C. F. Braun & Co. of Alhambra, California.

My personal background in industrial relations has provided me with a basic interest in manufacturing and construction safety. I also figure that the two million miles I have flown in pursuit of my job, qualifies me for a highly personal interest in transportation safety . . .

It takes men dedicated to the job of safety to always make it sound bright and brand new when they attempt to capture the interest of each individual worker.

In spite of the philosophy that there is rarely anything new, let's take a quick look at how recently we arrived at the present high level of the practice of industrial safety.

In his famous essay on compensation, Emerson points out that man invented the clock, but lost the ability to tell time by the sun. Today, we could say that in our practice of science we have conquered many diseases, but have also

developed the atom bomb that could take the lives of millions.

Our modern safety is comparatively new, and until the turn of the century, the welfare of the worker was hardly considered at all.

The first safety innovations were really improvements in engineering techniques that worked for the elimination of raw manpower by giving us the horsepower of machines.

For a time in doing this, we seemed to have lost our ability to think of the worker, except as a machine.

As the safety movement accelerated in the second decade of our 20th century, minimum requirements for machine guards for safe hoists and lifts were devised by Wisconsin, which set the example for other states to follow.

Our earliest standards for elevator installers were prepared in 1921 by the American Society of Mechanical Engineers (ASME), the same group that was responsible for our outstanding Boiler Code and the establishment of the National Board of Boiler & Pressure Vessel Inspectors.

By that time too, several of the most active states within the safety movement had also passed minimum safe practice requirements for painters, roofers, carpenters, etc., such as in the use of ladders, housekeeping, and shoring of trenches.

The National Safety Council was beginning to be heard through its chapters that were gradually being established in large cities throughout the country.

In 1933, in one of the darkest years of the Depression, when CCC camps and government-sponsored work projects were being carried on all over the country, the U.S. Army Corps of Engineers inaugurated a safety program for its construction work.

The results were so dramatic that both labor and management groups knew improvements were possible and that accidents were preventable.

World War II witnessed an appalling rise in industrial accidents, with

an accompanying realization by both labor and management groups that injuries must be prevented for humanitarian purposes, to save labor and production costs, and to eliminate lost time on the job.

What is the state of safety today?

While there are no grounds for complacency, there is sound basis for cautious optimism.

For one thing, there is more public awareness of the hazards on our jobs, the highway, and at home. And there are more organized efforts to reduce those hazards.

The safety program of the National Constructors Association is an example of measurable progress. NCA is composed of engineer-constructor firms which design and erect large scale industrial plants—oil refineries, chemical plants, steel mills, power generating facilities. Their work represents a significant part of America's heavy construction industry.

Heavy construction is admittedly an activity with special hazards to life and limb. In this field, according to the cold statistics of Workmen's Compensation Insurance companies, a man dies for every one million hours worked.

Because of NCA's safety program, it can be said statistically that at least 60 workmen live each year who would otherwise have died on NCA jobs.

For example, last year NCA recorded 13 fatalities while working 75 million manhours.

One of the top developments of our Governor's Industrial Safety Conference has been the fact that there have been no lines drawn by or between management, labor and government safety people.

To outsiders, the group assembled here is just a group of dedicated people working together to do the best possible job in safety.

Except for the way a Hollywood movie might play it, the time has long since passed when anyone could watch an audience such as this and pick out those individuals who represent management, labor or government.

The recent NLRB ruling that safety is a mandatory subject for collective bargaining will have, I hope, no effect on our willingness to work together.

In my experience, the detailed practice of safety has generally been kept out of the collective bargaining arena. When included in agreements, it has been basically a recognition of management's responsibility for safety.

Such agreements have always included a reference to management's conformance with state and federal safety requirements and that employees would comply with the safety rules, subject to the grievance procedure.

Management's responsibility of this area is indivisible; it can't be shared or bargained away, and it goes on regardless of the conditions or climate at the bargaining table.

It is my expectation that progressive management, along with labor and government, will continue to work together on safety matters, apart from the bargaining table, on the basis of mutual need and cooperation.

The recently revised California Construction Safety Orders are an example of the progressive way of handling safety matters between management, labor and government. . .

I have tried to avoid statistics or detailed definitions of safety, feeling it's better to leave that job to the experts later today in the conference seminars.

Also, it's much safer to quote from an expert such as George Sherman, than to come up with my own definition of safety.

Being realistic, George notes in a recent speech in Fresno, that such a thing as absolute safety does not exist, but there is something that can exist and in fact, does exist for the prudent and those wise enough to learn from the experience of others.

That something which we should cherish and preserve, is a high regard for reasonable safety.

The subject of George Sherman's speech was "*Just What Is Safety, Anyway?*" His answer to this question was —*attitude*.

He notes that our attitude towards safety is what will determine to what extent we shall make progress towards reasonable safety for all. I thoroughly agree with George that safety is truly dependent on attitude—or state of mind.

This attitude, because nothing is new, was beautifully expressed by an English poet over 300 years ago when he wrote: "*No man is an island unto himself.*"

He was pointing out even then that the problems of every individual are our problems and will affect all of us

in some way or another. This attitude is, I believe, part of the dedication of safety men to their jobs and also the reason why there is no simple answer to the practice of safety.

In conclusion then, let's take a look at how attitude applies to the practice of safety. According to the dictionary we have a choice of several basic definitions of the word "practice":

It can mean the mechanical repetition of a routine until it is learned. Or it can mean the attainment of a skill or profession through much repetition so as to become perfect in it.

The choice is ours. By our attitude we can determine how we practice safety.

Will it be the simple mechanical repetition of a routine or will it be the dedicated approach of the true professional?

The word "practice" in the professional sense is associated with the practice of medicine, law, or engineering.

Only by the dedicated practice of safety in its highest meaning can management, labor and government hope to keep pace with the rapidly expanding human safety problems arising from today's complex industrial civilization.



The large throng at the Conference luncheon, with General Chairman Ernest B. Webb at the mike

Some Section Pictures at the Conference



FOREST PRODUCTS

Left to right: Thomas H. Batterton, Paul M. Pugh, Ed O'Connor, Matthew A. Kuhta



MANUFACTURING

Left to right: Henry A. Hartmann, Russell G. Peterson, Dr. Robert Johnson, Walter Van Sandt, Norval McDonald, J. W. Eickman, John Chocholak



MINERAL INDUSTRIES

Left to right, seated: Gilbert L. Rhodes, Keith Griffith, Maurice I. Gershenson, Dale Marr, Robert D. Bailey
Standing: J. R. Signer, James J. McGlade, Lee Moody, Walter E. Ousterman, Kyle J. Lutz

A near-record gathering attended the Forest Products Section meeting at the Conference.

The highlights were a panel discussion on *Schedule Rate Guarding*, which covered credit for machine guarding, a history of schedule rating, and the purposes, principles and functions of the California Inspection Rating Bureau;

a talk on *Good Vision—Do You Have It?*, with information on how to check it, get it, and keep it;

a panel presentation on *Safety Problems in Logging and Lumbering*, featuring the importance of good housekeeping; proper felling and bucking; sound log handling; and guarding in plywood operations; and

a panel presentation on *Accident Prevention in Pulp & Paper Production*.

Highlights of the Manufacturing Section program at the Conference included a review of *Occupational Disease Prevention & Control Services Offered by the Department of Public Health*, and the need to properly detect and evaluate actual or potential health hazards;

What Organized Labor is Doing to Promote Job Safety, with particular reference to activities of the Sheet Metal Workers International Association;

Safety Incentives for Small and Large Employers; and

A Professional Safe Driving Training Program, used by Greyhound Bus Lines in training their bus drivers, with emphasis on defensive driving.

The Mineral Industries Section had the largest attendance in its Conference history, with more than 130 persons enjoying an excellent program.

The program included a presentation of estimated rates of work injuries in mineral industries in 1965;

a review of the proposed revisions of the *Pneumatic Loading of Explosives Safety Orders (Blasting)*;

a panel discussion on *Stopping Accidents Due to Work Procedures*;

a showing of the film *Piping Safety*; and

talks on *Truck Operations at Eagle Mountain*; and *Threshold Limits of Toxic Substances*.

Some Section Pictures at the Conference



TRANSPORTATION, COMMUNICATIONS, AND UTILITIES

Left to right: Linn Magoffin, Gordon Brown, Nate DiBiasi, Andrew T. Brozik, J. Robert Snyder, George W. Ballard

More than 230 persons attended one of the most successful Conference meetings of the Transportation, Communications, and Utilities section.

Highlights were a panel presentation on *Accident and Injury Prevention Through Physical Fitness and Medical Examination*, covering, among other things, automated multi-test laboratories, a long range program for the detection and prevention of coronary heart disease, and the importance of maintaining physical fitness;

a speech on *Psychological Aspects in Accident Prevention*, emphasizing the need for adequate communication and the elimination of management tensions that adversely affect employees; and

a report on *Railroad Grade Crossing Protection*.



AGRICULTURE

Left to right: A. J. Ford, Edward Wilson, Charles E. Farrell, Sidney S. Sutherland, Charles A. Kleinwachter, John O. Barnes, Norman Liddell



CONSTRUCTION

Left to right: Kenneth J. McElroy, E. J. Gale, Gary H. Bronneck, Arthur T. Eisele, John H. Jepson



GOVERNMENTAL AGENCIES

Left to right: Duane Hendrickson, Robert I. Schultz, Irv Schnayer, Robert S. Ford



TRADES AND SERVICES

Left to right: Harold K. Goddard, Bertha Metro, Emlyn L. Cox, Thomas Garrett, John O. Kinert

A Labor View of On-the-Job Safety...

California's chronicle of accomplishments for the general welfare of its people is a long and distinguished one.

Certainly we have a good industrial safety record—compared with other states, an *excellent* one. *But we can do better, and we should do better.*

We shall do better, if there is greater effort on the part of *both* management and labor, not only *singly*, but **JOINTLY**.

Management of course has the *legal* responsibility to maintain a safe workplace, which is as it should be. That responsibility is clearly spelled out in various sections of California's Labor Code.

Only in one place in that Code, as far as I know, is there *any* reference to the responsibility of the individual working man for safety.

But the *moral* responsibility for work safety belongs to us all. It is a responsibility none of us should shirk. For *morally* at least, safety is surely *everyone's* business, regardless of whether he is a worker or the president of a company.

Labor is not avoiding its moral responsibility. On the contrary, it is playing a steadily increasing part in furthering greater work safety.

Let me cite some of the things we are doing in this respect, and also what labor and management can do *together* for the good of all.

I know at first hand that labor-management cooperation can be extremely effective.

As electricity is in universal use in this country, we in the International Brotherhood of Electrical Workers are concerned with every aspect of industrial safety. Atomic radiation, communications, construction and maintenance, manufacturing, trades and services—you name it, and we can show you that we are affected.



W. L. Vinson
Vice President, 9th District
International Brotherhood of Electrical Workers

In fact, we are affected to such an extent that we have established a safety department in our International Office in Washington, D.C. It is the Department for Legislation and Promotion of Safety, headed by Victor Whitehouse.

The IBEW has for years been engaged in several joint labor-management safety ventures, largely pioneered in the Pacific Northwest among the power utility companies.

One such venture is the "Safe Practices Committee" of the Pacific Power & Light Company. This committee regulates safety practices within that company, and its manual on the subject has the same force and effect as if written into the labor agreement.

The Safe Practices Committee, established some 12 years ago, has resulted in phenomenal savings of both men and money. It has become the pattern in our International office as a practical manual for the utility industry.

In addition, it has been instrumental in promoting excellent cooperation in other labor-management relationships, the almost inevitable outcome of any good joint labor-management safety program.

Organized Labor's Record

Yes, organized labor is keenly aware of its moral responsibility for on-the-job safety, and the record shows it has not been remiss.

More and more unions are spending a greater part of their time in instilling safety consciousness into the minds of their members.

We are placing emphasis on safe work practices, safety films, safety talks, and safety dinners at which not only the worker but the whole family is invited.

We are stressing the *worker's* responsibility to work safely, not just for his own benefit, but for the benefit of his fellow workers and his family as well. We know all too well the repercussions from work injuries and deaths.

Many unions have assigned men to devote their full time to the on-the-job safety of their members. To these men, safety is not just a sideline; it is the whole show.

I hope that in another few years every union will have at least *one* full-time safety director—if possible a full time *staff*—so that safety will be a constant and continuing effort on the part of all unions, not just the periodic affair it sometimes becomes.

More and more unions have members who are thoroughly familiar with the technical safety problems in their field—men who know the causes of injuries in their particular industry, and how those injuries can best be prevented.

Management in general would be wise to avail itself of the immense fund of knowledge and experience in safety that these men possess.

More and more unions are playing an increasingly active part in the review of existing Safety Orders in California in recent years.

More and more unions are publicizing safety regulations in their locals, and recognize the necessity to discipline members who willfully and flagrantly violate or disregard those regulations.

Labor publications are devoting a good measure of space to safety in their special fields, and to how injuries can be prevented.

More and more unions are devoting a part of their regular business agenda to on-the-job safety. I would like to see that practice become a universal one.

More and more unions realize that safety rules and regulations are, at best, only *minimum* standards.

They know that if we are to drastically reduce the number of people killed or injured at work, we must *voluntarily* adopt standards and safe work practices *beyond* those legally required—as has, in fact, already been done by most companies boasting remarkable safety records.

Of Concern to Labor

We know too that some employers unfortunately still strive for profit making production efficiencies which all too often place profits ahead of worker safety, just as the marginal employer struggling to remain in business against his more efficient competition, sacrifices worker safety when he cuts corners in an attempt to preserve and improve his ability to compete. This has been proven to be a most fallacious concept in the long run.

Of continuing concern to labor and a real factor to be reckoned with in industrial safety is high unemployment, which aggravates the always present economic pressures on workers who, out of fear of job loss, overlook safety hazards.

I know that many managers still insist on the right to have full say—and the *only* say—about on-the-job safety.

They will contend it is a legal responsibility they cannot share with the bargaining unit. As they point out, the *legal* responsibility is theirs. No one questions this. It *is* their responsibility, as are the responsibilities of production and marketing.

But it is undeniable that the greatest measure of safety, like the greatest measure of production, can be achieved only with the full support of the workers themselves.

So it is merely sound business, apart from all humanitarian considerations, to *enlist* the cooperation of workers if maximum results are desired.

In my opinion, management misses a good bet if they do not permit labor to share the moral responsibility for safety at work. It would instill a sense of pride in the rank and file, and benefit everyone, directly and indirectly—the firm, the worker, the family, and the economy generally.

Seven Fundamentals

Joint labor-management safety committees have conclusively proved their worth wherever they have had a fair trial. But as far as industry as a whole is concerned, we have barely dipped into the reservoir that only joint committees can thoroughly tap.

Of course, such committees, to be effective, must follow certain fundamentals. I list seven.

1. Labor representatives must be chosen by the workers themselves or by the unions that represent them.

2. The committee should at all times have access to a *qualified* safety engineer—from the plant, the insurance company, or the state agency having jurisdiction, in our case the Division of Industrial Safety.

3. The committee's recommendations should be considered—and considered *promptly and thoroughly*—with satisfactory reason given for the rejection of committee recommendations.

4. The committee must have teeth, if it is not to degenerate into meaningless get-togethers, as too many committees unfortunately do.

Nothing so discourages employees from taking safety committees seriously as the suspicion that a committee is for appearance rather than action.

The committee should have power to immediately close down any operation that presents imminent hazard to life or limb.

Among other things, it should have authority to order men out of an unshored trench; to require immediate use of an unused guard; to correct poor housekeeping without delay; to instantly stop unsafe work practices, and to compel the use of necessary safety equipment.

Enforcement of Safety Orders and accepted safety practices in an industry should be handled by the joint safety committee itself, and should not have to go any higher for approval.

5. Any committee, equally represented by labor and management, should be small enough to be effective.

In a concern of only a few hundred people, six members should be enough, in my opinion, if it is not to be unwieldy. Large concerns with thousands of employees in various departments would of course need several committees.

6. Some authorities recommend rotation of personnel on joint safety committees.

I myself don't favor rotation for the sake of rotation.

If a committee, or the members of a committee, do a truly fine job, why should they not be retained? Why re-

place men who are skilled and experienced in safety, if they perform well?

Skill and experience and safety know-how are not easily acquired, and qualified workers with years of experience and good safety records and accomplishments *should* man the committees, especially if their record is successful.

Of course, this does not mean that potential replacements should have no training in the fundamentals of accident and injury prevention. *Every* worker should have that.

7. *Joint safety committees should be completely divorced from all other aspects of industrial relations.*

However, it is an indisputable fact that cooperation in work safety invariably results in greater harmony in other areas of industrial relations, to benefit not only management and labor but the general public as well.

I hope I have clearly outlined not only the proof of the need and value, but also the *requirements*, of sound joint labor-management safety committees. There is no substitute for them, and nothing can replace them in a safety program.

Work safety has good friends in California.

Governor Edmund G. Brown has proved his devotion to it. Director of Industrial Relations, Ernest Webb, whose interest in it is manifested not only at these annual conferences but throughout the year. A Division of Industrial Safety and an Industrial Safety Board, whose safety regulations serve as a model for other states and countries. A state program of safety education, engineering, and enforcement that is generally excellent. And a Division of Labor Statistics and Research that provides a wealth of figures and studies which pinpoint the areas where greater safety efforts should be directed.

All in all, we have the tools and weapons to rout our common enemy—industrial injury and death. ***If labor and management will work closely with each other under the same banner, the banner of injury prevention, a great victory will be ours.***



The speakers' table at the general assembly of the Conference.

Left to right: Virgil L. Collins and Richard K. Humphries, both members of the Industrial Safety Board; Geo. A. Sherman, Chief of the Division of Industrial Safety; Paul L. Wetcher, Manager, Labor Relations, C. F. Braun & Company; Earnest B. Webb, Director of the Department of Industrial Relations; W. L. Vinson, Vice President of the 9th District of the I.B.E.W.; and Jack F. Hatton, of the Industrial Safety Board.

Offices of the Division of Industrial Safety

The following is a list of main and field offices of the DIS.

MAIN OFFICES

SAN FRANCISCO	455 Golden Gate Ave.	557-1946
Los Angeles	3460 Wilshire Blvd.	381-5695

OTHER OFFICES

Bakersfield	225 Chester Ave.	324-6437
Chico	341 Broadway	343-5182
Eureka	619 Second St.	442-5748
Fresno	2550 Mariposa St.	268-7151
Long Beach	230 East 4th St.	432-8443
Merced	550 W. 22nd St.	723-4561
Oakland	1111 Jackson St.	834-3460
Redding	2115 Akard Ave.	241-5100
Sacramento	1107 Ninth St.	445-5818
Salinas	307 Soledad	424-4807
San Bernardino	478 West Base Line	884-6461
San Diego	1350 Front St.	232-4361
San Jose	888 North First St.	294-1525
Santa Ana	1619 W. 17th St.	547-1603
Santa Barbara	411 E. Canon Perdido	966-2918
Santa Rosa	750 Mendocino Ave.	542-8802
Stockton	31 E. Channel St.	466-3547
Ukiah	305 N. Main St.	462-8850
Ventura	3418 Loma Vista Road	642-9679

To those interested in accident prevention in industry, a number of publications of the DIVISION OF INDUSTRIAL SAFETY will be of value.

For obvious reasons, we do not send more than three complimentary copies of any brochure to anyone outside the State.

Bulletin 104 (Rev.), "Ground It!" explains the necessity and wisdom of grounding electrical hand tools.

Bulletin 107, "The Ship-Shape Shop," shows how good housekeeping and maintenance will save lives, limbs, and money.

Bulletin 110, "Tips for Hotel Workers," shows that hotel worker accidents are easily prevented if a few simple tips are followed.

Bulletin 117, "Stop Grinding Out Injuries!" is about the abrasive wheel, and gives pointers which, if observed, will eliminate almost all grinding wheel injuries—of which over half are eye injuries.

Bulletin 120 (Rev.), "Safety Rules for Painters," tells you the four things that cause four out of five injuries to painters, and shows you how to prevent such injuries.

Bulletin 121 (Rev.), "Ladder Safety—Step by Step," shows that there is no bad luck about ladders when you observe three common-sense precautions.

Bulletin 122, "Handy Rules for Hand Tools," describes the proper care and use of such tools as files, screwdrivers, wrenches, chisels, hammers, knives, and handsaws.

Bulletin 124 (Rev.), "Safety Rules for Roofers," analyzes roofer injuries in a 12-month period and tells how to prevent them.

Bulletin 125 (Rev.), "Are You Using Carbon Tet?" deals with a chemical that has caused work injuries and deaths.

Bulletin 127, "Look Out for Yourself If You Are Around Crop Spraying," an illustrated booklet directed to the farm worker himself, explains how pesticides can be used safely. (Available in Spanish also.)

Bulletin 128, "If You Work in a Quarry," is for the quarry and open pit mine worker, and points out the things he should keep in mind.

Bulletin 133, "Analysis of California Logging and Sawmill Fatalities," contains a study of logging and sawmill deaths in California, and an injury-prevention program.

Bulletin 135 (Rev.), "Check List of Requirements," a guide for employers, safety engineers, and purchasing agents, shows what they should check for before buying or renting equipment or placing contracts.

Bulletin 137, "Skin Trouble Is Plenty Trouble," deals with the most common disease you can get at work.

Bulletin 138, "Supervision and Explosives Accidents," analyzes explosives injuries in California in a three-year period.

Bulletin 140, "Keep AWAY From Power Lines!" is for any and all workers whose jobs may expose them to the hazards of overhead electric power lines.

Bulletin 141 (Rev.), "Power Hand Saw Safety," gives common causes of power hand saw injuries, and tells how to stop them.

Bulletin 142, "Read and Understand the Label!" reminds us how vitally important it is to read and understand the labels of containers of hazardous chemical and mixtures.

Bulletin 143, "Trade Association Safety Programs," shows the value of such programs and what they can do for you.

Bulletin 144, "The Know-How of Wire Rope Safety," gives information that the man on the job and his boss should know.

Bulletin 150, "Electrical Safety and Swimming Pools," describes precautions that would make swimming pools safe electrically.

Bulletin 151, "Control of Noise in Industry," emphasizes the need for either eliminating or controlling excessive noise, and gives practical methods for doing so.

Bulletin 153, "Electrical Safety on the Farm," points out the many electrical hazards encountered on the farm, and tells how to guard against them.

Bulletin 154, "The Tailgate Safety Meeting," gives pointers on an effective means of promoting on-the-job safety.

Bulletin 155, "Pesticide Regulations," tells how to guard against hazards in the use of poisonous and toxic pesticides containing organic phosphates.

Guard Standards, No. 1, Materials and Construction, gives invaluable advice on constructing guards and selecting the right materials for them.

Guard Standards, No. 2, Stairways and Railings, gives requirements for stairways, railings, entrances to stairways, and floor and wall openings.

Form 634, an 8½" x 11" placard. *Safety Responsibilities—Employer and Employee—*prescribed in Labor Code. (Available in Spanish also.)

Power Press Safety

Transportation of Workers — Current California Regulations

Lifting With Safety (Limit within California: 100 copies for any organization, one copy for any individual)

Several construction bulletins, omitted from this list, are being amended in the light of the recently revised Construction Safety Orders.

The following Safety Orders are available from Documents Section, P.O. Box 1612, Sacramento, California 95807.

Where Safety Orders have been revised (as almost all of them have been), the date is the date of the latest revision.

Money orders or checks made payable to the Documents Section must accompany all purchase orders. Don't send stamps.

Documents Section gives a 10% discount on purchases of 50 or more copies of any one title.

Don't forget to add 4% sales tax if you live in California.

	Price	With sales tax
Aerial Passenger Tramway Safety Orders (1956).....	\$0.50	\$0.52
Boiler and Fired Pressure Vessel Safety Orders (1955).....	.50	.52
Compressed Air Safety Orders (1946).....	.50	.52
Construction Safety Orders (1965) bound 4½" x 7½" in loose-leaf form 6" x 9".....	1.50 3.00	1.56 3.12
Electrical Safety Orders (1962).....	1.50	1.56
Elevator Safety Orders (1954).....	1.00	1.04
General Industry Safety Orders (1963).....	1.00	1.04
Logging and Sawmill Safety Orders (1958).....	1.00	1.04
Mine Safety Orders (1958).....	.75	.78
Petroleum Safety Orders—Drilling and Production (1959).....	1.00	1.04
Petroleum Safety Orders—Refining, Transportation and Handling (1951).....	.75	.78
Pneumatic Explosives Loading Safety Orders (1944), Quarry and Open Pit Mine Safety Orders (1953).....	.75	.78
Ship and Boat Building Safety Orders (1961).....	.50	.52
Tunnel Safety Orders (1962).....	.75	.78
Unfired Pressure Vessel Safety Orders (1964).....	.75	.78
Window Cleaning Safety Orders (1952).....	.50	.52

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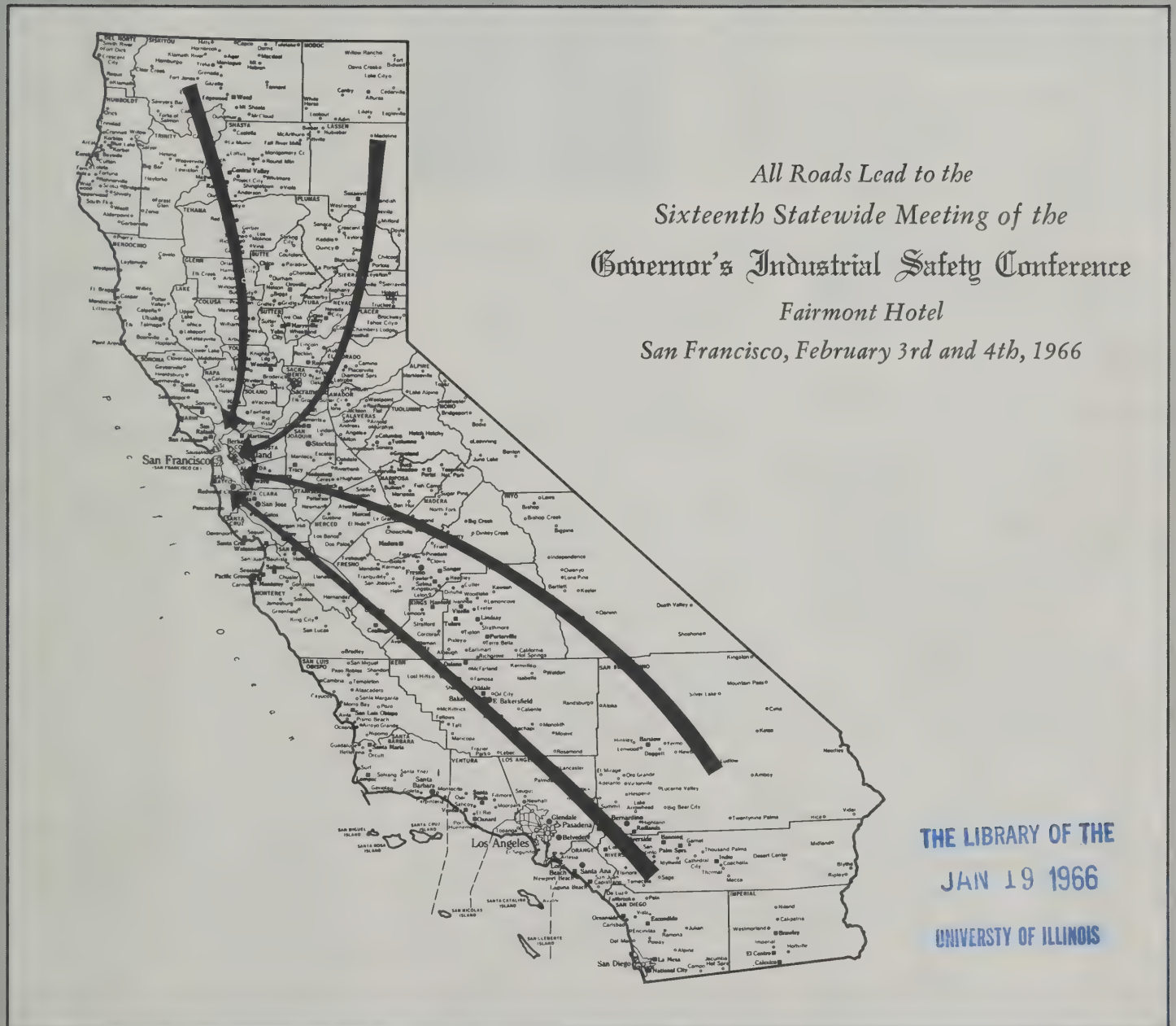
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Just What Is Safety, Anyhow?.....	Page 3



California Safety News

Vol. 49, No. 4, December 1965

The California Safety News is mailed free of charge to those interested in industrial safety

The Forthcoming Conference...

In another few weeks, the Governor's Industrial Safety Conference will hold its sixteenth annual two-day statewide meeting.

The Conference, which has earned a deservedly high reputation, has several features that have impressed not only Californians but those of other states and other countries.

It is, in effect, eight separate conferences of major industry-groupings or sections, held together by an opening assembly and a closing luncheon. Each section's program, geared to that particular section, covers current subjects of especial interest to its members.

The Conference confines itself to on-the-job safety, the only aspect of safety with which it is directly concerned.

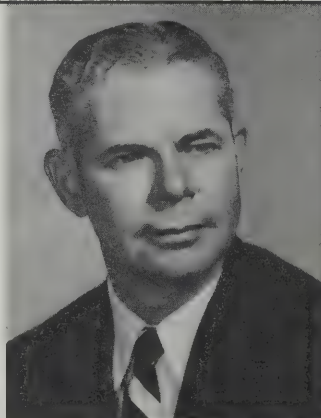

Equal management and labor representation on all committees is a fundamental policy of the Conference.

The Conference is no avenue for controversial issues or for attacks on either management or labor. The only "controversy" permitted is on *whether* there are hazards, and on *how* hazards can best be eliminated or controlled.

No recommendation is presented at section meetings at the annual meeting of the Conference unless it has been submitted to the section committee concerned at least 60 days earlier and received committee approval. This of course does not rule out recommendations from the floor for referral or study by section committees.

The achievements of the Conference have been many and significant, as those who have attended in the past well realize, and as I hope those who attend it this coming February will appreciate.

As always, I look forward to then meeting old friends and new.



In This Issue...

As the cover reminds us, all roads lead to the *Governor's Industrial Safety Conference—San Francisco, February 3-4*. Page 10.

The facing page contains an answer to the often-asked question *Just What Is Safety, Anyway?*

Highlights of the Revised Construction Safety Orders, which became effective in August, are given on page 6.

This issue records a *Dramatic Illustration of the Value of SO*, page 12, and further proof that there is *No Substitute for Safety Surveys*, page 14.

Recent Convictions for Violations of Safety Orders are listed on page 13.

Believe it or not, *Ni(CO)₄—MAC .001 ppm!* Page 14.

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MICHAEL FLAGG, Editor

Just What Is Safety, Anyhow? . . .

(Because of the importance of the philosophy expressed, we reprint the Chief's speech in Fresno on September 20th before the Eighth Western Fertilizer Industry Safety School of the California Fertilizer Association.—Ed.)

From the cradle to the grave, we face perils of one sort or another.

As an infant, as a young child, as a teenager, as an adult—at work and at play—we face the ever present possibility of accident and injury. It may spring from our *own* action or lack of action, or the action or lack of action on the part of *others*.

Falls, fire, flood, tools, machinery, automobiles, planes, street riots, juvenile delinquency, infections — in these and a thousand other things lie the *potentials* for accident and injury.

The surprising thing is not that so many people are injured, on and off the job, but that so many actually reach the Biblical age of three score and ten.

For the fact is that *potentials* for injury exist in *everything*. Even if we were to remain in bed throughout our existence, it would not guarantee us freedom from injury. For as the medical world tells us, older people sometimes injure their bones by the mere action of shifting their position while in bed.

So it is pretty plain that absolute safety simply does not exist. There is just no such thing.

However, there *is* something that *can* exist, and in fact *does* exist for the prudent, and those who are wise enough to learn from the experiences of others. That something, which we should cherish and preserve, is a high regard for *reasonable safety*.

Reasonable safety is something we *can* achieve. It can be stimulated, developed and increased by engineering, enforcement, education and discipline. This has been demonstrated in innumerable instances.

In cotton gins, in the use of powder actuated tools, in the operation of power punch presses, in elevator operation—to name just a few ex-

amples—a greater measure of safety has been achieved.

As far as *industry* is concerned, the California Legislature wisely recognizes and accepts that *a concept of total safety* can remain only that—a *concept*. Therefore, throughout the laws relating to safety standards that the Division of Industrial Safety administers, the word *reasonable* occurs time and again.

The Labor Code, for instance, gives the following definition of *safe* and *safety*:

“*Safe and safety* as applied to an employment or place of employment mean such freedom from danger to the life or safety of employees as the nature of the employment *reasonably* permits.”

The Code authorizes the Division to “fix *reasonable standards*”—“enforce *reasonable orders* for the adoption, installation, use, maintenance, and operation of *reasonably* uniform safety devices . . .”

It says also that “every employer shall do every other thing *reasonably* necessary to protect the life and safety of employees.”

(The emphasis throughout is mine.)

Two points are clear to the thinking man.

One is that we *cannot* progress without *some* risk-taking. Progress and risk are inseparable.

The other is that risks *can* be *reasonably* controlled. In any situation where they cannot be *completely* eliminated, they *can* be kept to a minimum.

The tremendous space exploits in recent years—far exceeding the wildest imagination of people a century ago—bear witness to this fact.



Geo. A. Sherman, Chief
Division of Industrial Safety

Safety (or lack of safety), like love or sin, is as old as man himself. And because it is so old, it is a subject flooded with clichés.

Living is too complicated today, however, for us to summarize the total concept of man's health and safety in just one expression, or appraise it in the light of a single, simple criterion.

In recent years, injury prevention activity in its entirety seems to have entered the garden of paradox, not paradise.

A half a century ago, any freedom man achieved from exposure to risk and danger was accomplished largely by the principle of *isolation*. Today it is not so simple.

Safety in today's world calls for sophisticated risk control. Without it we cannot successfully resolve the burgeoning problems arising from population explosion, automation, mechanization, and unemployment—and the many and varied stresses they impose on man.

As we become more and more a consumer society, we must become more and more alert to our total environmental exposure, not just one or two fragments of that exposure. I believe that the future is rushing towards us not only from many directions, but with such speed as to thrust upon us many problems most difficult to analyze, understand, and resolve.

However, there are encouraging developments — developments proving

that many responsible individuals in our system of free enterprise and democratic way of life are acutely aware of *the need to relate man's total exposure to his total life*.

That recognition reflects a sane and progressive attitude, one that is of immense and vital importance.

Incidentally — and this is something I am afraid we sometimes lose sight of—*it is free enterprise that has brought such enormously improved standards of living in this country*.

We should remain vigilant in seeing that free enterprise continues to operate, of course always with proper concern and consideration for our fellow man. That proper concern and consideration includes *reasonable safety for all*.

It is our *attitude towards free enterprise* that has created an environment where the lot of society generally has so vastly improved.

And it is our *attitude towards safety* that will determine *whether*, and to what *extent*, we shall make progress towards *greater safety* on the job.

As I have said more than once, philosophy and attitude are most important in determining whether any endeavor will succeed or fail.

The *philosophy*, if sound, gives us the platform on which we can build much of value to us all.

The *attitude* determines *whether* we will do our best to live up to the philosophy.

If our attitude is passive, and consists merely of lip-service, we will do little.

But if our attitude is active and constructive, we can accomplish great things.

I am glad to say that management, labor, and government are, on the whole, working well together in striving for greater on-the-job safety. Certainly government is doing all it can.

That cooperation will be intensified if we all realize that not only

our legal but our moral responsibilities should be fulfilled.

Some employers still refuse to allow labor any part in a safety program. Which of course is their prerogative, as the legal obligation for work safety is management's. But our American philosophy is based on consent of the governed; and we know that laws are as a whole more honored and respected when they who are affected have a voice in preparing them. I feel that labor could, and would, contribute much more to work safety generally if given greater opportunity.

That opportunity should of course be a real one, a true sharing concept, not just a fictitious one. And any joint management-labor safety committee should be completely divorced from all other aspects of industrial relations . . .

With the increasing mechanization of agriculture, we can expect an increase in farm machinery injuries, and statistics show that this has indeed been the case.

The *number* of disabling farm injuries declined last year—from 16,474 in 1963 to 16,022 in 1964.

The *rate* of farm injuries also declined—from 67.9 per 1,000 workers in 1963 to 65.4 in 1964.

However, the number of farm machinery injuries increased sharply—from 2,100 to 2,292, a rise of 9%. This shows one area where greater efforts for farm safety are needed.

Tractor injuries, a sore spot in agriculture, were up—from 945 to 964.

While the picture of agricultural injuries as a whole is somewhat better, it is still far from pleasing. *And when one out of every fifteen farm workers is injured during the year to the extent where he cannot work the following day, it is obvious that we have our work cut out for us*.

What can we do?

We can do at least two things. And if we do them conscientiously, we shall sharply reduce the toll of farm injuries and deaths.

One is to make certain that farm machinery is adequately guarded.

The other is to concentrate on the less dramatic areas where most injuries occur today, as indeed they have in the past. Figures from the Division of Labor Statistics and Research, which began compiling comprehensive injury statistics twenty years ago, bear this out.

These statistics show that in farming, as in industry as a whole, roughly *three out of every four injuries fall into three major accident types*:

*strain or overexertion (except heart)
falls and slips
striking against objects or being struck by them.*

If, by continuing education and effort, we can make a serious dent in injuries involving these three accident types, we shall make great headway in reducing both the number and the rate of work injuries in agriculture.

Usually involved in these injuries are what some call the *M's*:

*Man
Machinery
Motion (or lack of Motion)
Manipulation*

I would add this: Any *Misuse* or *Mistake* invites a *Mishap*.

However, there are other *M's*—*M's* that, if encouraged, will help to prevent accidents and injuries:

*Maintenance
Maturity
Mind
Motivation*

They are essential to the climate for greater work safety. But they will be employed to the fullest degree only if we have the right attitude mentioned earlier.

So to the question "Just what is safety, anyhow?", the answer in a nutshell is this: *Attitude*—the *right* attitude.

Letters to the Editor...

I find your magazine, CALIFORNIA SAFETY NEWS, very interesting and informative.

—S. D. Eke, Federal Ministry of Labour
Lagos, Nigeria

This publication [the CALIFORNIA SAFETY NEWS] has proved to be of great value to the many professors and students to whom our Center is available.

—Robert F. Wilcox, Director
Public Administration Program
San Diego State College

Your *Alphabet of Industrial Safety* appeared in the September 1965 issue of our Safety Bulletin. . . . Appearance of the item . . . has caused a great deal of favorable comment.

—William E. Hughes
National Fibre Can and Tube Association

We have over the years greatly appreciated your generosity in having us on your mailing list. This has been very helpful to us in the information obtained through the articles published.

—Fred E. Green, Jr., Safety Specialist
First Insurance Company of Hawaii, Ltd.

The CALIFORNIA SAFETY NEWS . . . has been one of the most useful reference materials for us.

—Kenji Okada, General Managing Director
Accident Prevention Association, Tokyo

I have, for the first time, read an issue of your publication, the CALIFORNIA SAFETY NEWS, and I find the material and information it contained can enhance our accident prevention program on the station.

—A. J. Elizaga, Safety Officer
U.S. Naval Station, San Francisco

I would be most appreciative . . . for a copy of each listed bulletin of the DIVISION OF INDUSTRIAL SAFETY. This Division is now preparing an accident prevention course to be taught in industry and city governments. I feel certain that a great many ideas could be gathered from the bulletins that would assist us . . .

The fact that your Industrial Safety Division has done such an outstanding job in safety is the reason we are soliciting your help in trying to do a better safety job in Colorado. Your [CALIFORNIA SAFETY] NEWS is received regularly and read with much interest . . .

—Kenneth D. Adams, Director
Safety Devices and Methods Division
Industrial Commission of Colorado

Letter to the Director

The CSN . . . brings many helpful hints and fine articles . . . of great value in furthering our States safety programme.

I was wondering whether it would be possible for you to send a copy of . . . *An Alphabet of Industrial Safety*.

—Sri M. K. Hoy, Inspector of Factories
Patna, Bihar, India

Letter to the Chief

Since I visited your Department in February, 1964, I have received the CALIFORNIA SAFETY NEWS and wish to congratulate you and your staff on its excellent contents. I never fail to read it from cover to cover and always with personal benefit.

—C. Grant Gibson, P. Eng.
Director of Safety & Technical Services
Department of Labor, Ontario, Canada

We feel your help as Editor of the CALIFORNIA SAFETY NEWS and the assistance of officials and engineers of the . . . DIVISION OF INDUSTRIAL SAFETY have contributed materially to the improvement in our safety records. [86% reduction in the frequency rate, and a 99% reduction in the severity rate.]

—Marc Burbridge, Regional Safety Engineer
Bureau of Reclamation, Boulder City, Nevada

We are . . . having to cope with the problem of electrocution through contact with overhead transmission lines through aluminum irrigation spray pipes The information we obtained from your September 1964 issue of CALIFORNIA SAFETY NEWS is proving of much value.

—P. Redelinghuys, Chief Inspector of Factories
Ministry of Labour and Social Welfare, Rhodesia

THREE-YEAR BOX SCORE

Disabling Work Injuries and Deaths ^a in California

Month	Disabling Work Injuries			Deaths ^a		
	1964	1963	1962	1964	1963	1962
January	14,534	14,437	13,713	63	43	56
February	13,911	12,622	12,014	60	48	20
March	16,066	13,289	12,640	56	57	83
April	15,514	14,157	15,172	62	57	30
May	14,944	13,520	14,463	56	58	73
June	15,023	13,352	12,567	64	36	60
July	16,847	17,267	15,617	50	67	79
August	16,347	15,089	14,403	64	54	60
September	16,065	16,915	14,864	60	89	60
October	15,255	16,906	15,952	67	49	61
November	14,984	12,094	13,224	67	50	68
December	12,683	13,827	11,379	57	42	46
12-month total	182,173	173,475	166,008	726	650	696

Injuries up 5.0% from 1963
Employment up 3.5% from 1963

^a In January 1964, the definition of a "work fatality" for statistical purposes was revised to exclude all compromise and release settlements, except where the sole issue is dependency. Monthly fatality totals for 1962 and 1963 have been revised to conform to the new definition.

(Source: Division of Labor Statistics and Research)

Highlights of the Revised Construction Safety Orders...

By JACK M. VALOV, Supervising Engineer, Construction Section, Division of Industrial Safety

The revised Construction Safety Orders became effective on August 8th, 1965, thirty days after filing with California's Secretary of State.

They were adopted by the Industrial Safety Board in June, after two years of intensive committee work followed by public hearings in both San Francisco and Los Angeles.

Labor and management were commended by Governor Edmund G. Brown for their wholehearted cooperation in the revision of the Orders, which he described as *"another step in the direction of greater safety in a multibillion dollar industry, for they cover new methods, new processes, and new machines introduced by new technologies."*

Another tribute was voiced by Ernest B. Webb, Director of California's DEPARTMENT OF INDUSTRIAL RELATIONS, in the CALIFORNIA SAFETY NEWS:

"Labor and management, the two great segments of California industry, deserve much praise for their contribution to the revised Orders."

"Lively difference of opinion marked the many meetings, large and small, held during the two years that it took to complete such a major revision. It is to the credit of labor and management that the differences were harmoniously resolved, after full and complete discussion and exchange of ideas."

The revised Orders contain not only many revisions of the old Orders, but several entirely new sections.

Highlights include:

- a safety program for all construction contractors;
- control of surface drilling dust;
- greater control of electrical hazards peculiar to the construction industry;
- increased use of safety belts and safety nets;
- requirements covering falsework and vertical shoring in concrete construction;
- access to multistory buildings during construction; and
- improved regulations for shoring of trenches.

Safety Program a Must for ALL Construction Contractors, Large and Small (SO 1509)

While the old Orders required all construction employers to inaugurate and maintain a safety program, the emphasis was on large contractors.

A major change in the revised Orders makes it clear that ALL construction employers, regardless how few workers they employ, must have a safety program.

SO 1509 lists the requirements, a few of which are:

- regular inspection at frequent intervals by capable, responsible supervisors of all excavations, forms, scaffolds, stairs,

ladders, structures, machinery and equipment;

- report of violations of Safety Orders and safe practices;

—immediate corrective measures to eliminate hazards directly under the control of the employer;

—the adoption and use of a code of safe work practices and procedures, with the code posted in a conspicuous location at each job site, and with each supervisory employee provided with a copy;

—frequent meetings, at least once a month, of all foremen, to discuss safety problems and accidents that have occurred; and

—“tool box” or “tailgate” safety meetings on the job at least once every ten days, to emphasize safety in operations.

This functioning safety program for ALL contractors is the most important requirement in the revised Orders.

It emphasizes the recognition that CONTINUING safety activity on the job is the key to reducing the toll of death and injury in construction, a major California industry.

Improved Regulations on Shoring of Trenches (SO 1540-1544)

In the old Orders there were different shoring requirements for four types of soil—hard compact; saturated; unstable; and running.

There was much difference of opinion as to what is saturated soil, and what is *not*. The revised Orders no longer include what proved to be a highly questionable classification—saturated soil—and now recognize only three classes: hard compact; unstable; running.

This will allow contractors to determine soil conditions simply—by visual inspection at the site.

Requirements now include in *table form*, for the first time, size of pipe braces.

A new Order gives contractors greater latitude in shoring.

Contractors may now submit to the DIVISION detailed data, prepared by a civil engineer, for unspecified shoring systems. This data must include soil evaluation, slope stability, estimation of forces to be resisted, together with

plans and specifications of the materials and methods to be used.

The DIVISION will review any applications received, and will accept those considered satisfactory.

This should encourage contracting agencies to require that all bids include a detailed and acceptable shoring system.

Contractors would then realize that adequate protection from the hazard of moving ground is required as a *bid* item; and this should make for greater safety in shoring of trenches.

Canopy Tops on Crawler Tractors, Bulldozers, Carryalls, and Similar Equipment (SO 1595)

A major requirement calls for increased use of canopies or other adequate protection for the operators of crawler tractors, bulldozers, carryalls, and similar equipment, in situations where there is a possibility of injury

to the operator from falling or rolling objects.

Specifications for construction of such protective devices are now included.

Canopy tops must be strong enough not only to protect operators from brush or falling rock, but also to prevent them from being crushed if the equipment rolls over. Seat belts are also required in such circumstances.

Electrical Requirements for Construction Work (SO 1760-1768)

These new additions to the Construction Safety Orders apply only to *temporary* power and lighting installations for buildings and structures under construction, remodeling, maintenance, or demolition.

In no way do they apply to work of a permanent nature.

Electrical requirements relating to work of a *permanent* nature continue to be covered by the *Electrical Safety Orders*.

Temporary wood service poles must be at least 6 inches by 6 inches if square, or have a top diameter of at least 5 inches if round. In both cases they must be at least 20 feet long.

Overcurrent protection must be provided by circuit breakers for each feeder and branch circuit. Fusing is not permitted.

Approved electrical configurations are required for receptacles for 110 volt and 220 volt use.

Hoisting Signals (SO 1612)

Standard signals have been established. They are the first signals nationally approved by both the International Union of Operating Engineers and the Associated General Contractors.

They will make for smoother operation and greater safety, because workers going from one job to another, one contractor to another, and one area to another, will have standard signals to follow.

Dusts, Fumes, Mists, Vapors, and Gases in Confined Spaces (SO 1530-1535)

Hazardous concentrations of dusts, fumes, mists, vapors and gases continue to cause injuries and deaths in confined spaces such as storm drains, sewers, vaults, utility pipelines, and manholes.

The new Orders on this subject are designed to alleviate this situation.

They require such hazards to be controlled in any of several ways:

- reducing the degree of the hazard;
- removing workmen from exposure to it;
- general ventilation;
- local exhaust ventilation; and
- the use of approved respiratory protective equipment.

The key to prevention of injuries in confined spaces is adequate tests for the detection of combustible or dangerous gases immediately *before* a workman enters a confined space, and at frequent intervals *while* he is in it.

Control of Surface Dust (SO 1538)

To protect workers from dust hazards in drilling holes in earth or other dust-producing material, all power-controlled air drilling must now include the *"use of water or chemical solutions . . . or other equivalent means."*

Called by various names — *damp drilling, detergent drilling, modified wet drilling* — the method has proved its worth in controlling dust in many Northern California projects in recent years.

Safety Belts and Lifelines (SO 1670)

The revised Orders call for increased use of safety belts and nets for people working in elevated positions where there is a danger of falling.

Unless protected by *other* means, workmen exposed to the hazard of falling more than 15 feet must wear approved safety belts and lifelines.

If a worker's duties require horizontal movement, a rigging must be provided so that the lifeline will slide along with him.

This rigging must be provided for all suspended staging, outdoor advertising sign platforms, floats, and all other catwalks or walkways 15 feet above the ground or level beneath.

Warning Devices (SO 1592)

Without exception, *every* truck with a body capacity of 2½ cubic yards or more that is used to haul materials must have a warning device that operates *automatically* while the vehicle is backing. The warning sound must be loud enough to be normally audible at a distance of 200 feet.

If conditions make it necessary, a signalman, in clear view of the operator, must direct backing operations.

All haulage vehicles, including self-propelled graders equipped with pneumatic tires, must have a *manually* operated warning device which can be clearly heard 200 feet away.

Crane Counterweights (SO 1585)

Crane counterweights are now limited in weight to the manufacturers' recommendations.

This should prevent cranes from being used for loads for which they are not designed.

Employers must require visual inspection, at adequate intervals, of wire ropes, bearings, gears, friction clutches, brakes, chain drives, and other parts that are subjected to wear and tear.

The division has authority to insist on properly detailed maintenance records.

Falsework and Vertical Shoring for Concrete Construction (SO 1717-1718)

These Orders relate to a phase of concrete construction that had not previously been specifically covered by Construction Safety Orders.

This phase is the pouring of concrete slabs, which are being increasingly used, especially in freeway construction.

Some of the many requirements follow:

—Falsework or shoring for support of forms and concrete or other materials must be designed and constructed to safely carry imposed loads.

—The lateral loads for wood shoring to

be resisted at each floor in both directions must be not less than 100 pounds per lineal foot or floor edge or 2 percent of the total dead load of concrete, whichever is greater.

—If the design for falsework or shoring has not been approved by the responsible enforcing agency, the DIVISION OF INDUSTRIAL SAFETY may require evidence that the design is safe.

—All vertical shoring must be erected on a properly compacted and reasonably level and stable base. Plates and pads must be adequate to support the imposed loads. Reasonable precautions must be taken to make sure that weather and pouring conditions do not change the load-carrying capacity of the soil below the designed minimum.

Haulage and Earth-Moving Equipment (SO 1590-1595)

All self-propelled, pneumatic-tired equipment used mainly for quickly moving large quantities of earth must now be provided with fenders and an approved emergency braking system.

In addition, by August 8, 1966, at the latest, such equipment must have approved seat belts and roll-over bars or similarly effective protection.

Better brakes are also required. They must meet Vehicle Code standards, and must be maintained in good condition.

The Orders specifically state that

earth-moving equipment must not be operated at speeds that will endanger the driver himself or traffic generally. And they authorize the DIVISION OF INDUSTRIAL SAFETY to establish maximum safe speed limits based upon such factors as the weather, condition of the roadway, curves, grades, traffic volume, and mechanical limitations of a vehicle.

This should help to put an end to many accidents (including overturning of construction vehicles) caused by excessive speed.

New Requirements on Climbing or Tower Cranes (SO 1618)

Among other things, the Orders require all parts of the crane and supports to be designed and constructed to withstand all expected stresses, and to be erected as recommended by the manufacturer.

Also required is better access to climbing or tower crane parts that workmen must adjust or maintain.

There must be walkways, handholds, or footholds, safety lines, and

other necessary safeguards that will reduce the hazard of workmen falling from the crane.

Load limit devices must be in effective operation as recommended by the manufacturer. They may not be readjusted to permit the handling of greater loads.

The DIVISION OF INDUSTRIAL SAFETY may require testing of load limit devices at any time.

Requirements Regarding Explosives (SO 1550-1580)

The revised Orders require all magazines to be kept closed and locked, except when the contents are being removed or replaced. Keys must be kept in a safe place, and only persons authorized by the employer may unlock a magazine or remove supplies from it.

Another new requirement is that inventory tally sheets must be provided for each first-class and second-class magazine. The quantity of pow-

der or detonators added or removed must be recorded on the tally sheet, together with the date and the person concerned.

The U. S. Bureau of Reclamation *blasting signals* have been incorporated into the Orders, as the Bureau is the contracting agency for much construction work in California.

Storage and flashlight batteries are banned as a source of electric current for blasting.

Competency of Blasters (SO 1550)

To help put an end to accidents and injuries caused by unqualified blasters, the revised Orders now state:

“The DIVISION may require that a blaster furnish satisfactory proof that he is familiar with explosive materials; the equipment and protective devices necessary for blasting operations; the safety precautions necessary in conducting blasting operations; and that he is competent to perform any and all actions necessary or incidental thereto.”

Rolling Scaffolds (SO 1646)

Workmen may not ride on rolling scaffolds unless:

—the floor or surface is within 3 degrees of level, and free from pits, holes, or obstructions;

—the width of the base of the scaffold is at least half its height;

—outriggers, if used, are installed on *both* sides of the staging; and

—wheels have rubber or similar resilient tires, unless tower scaffolds are at least 50 feet tall, in which case metal wheels may be used.

Airless Spray Guns (SO 1705)

Airless spray guns that project paints and fluids at pressures of 1,000 psi or more must be equipped with an automatic or visible manual safety device to prevent the trigger from operating until the safety device is released.

All airless spray guns are required to be approved by the DIVISION OF INDUSTRIAL SAFETY.

Loading or Lifting Devices (SO 1588)

The Orders require guarding of scissor points on all front end loaders that constitute a hazard to the operator.

If they have a capacity of 1½ cubic yards or more, new front end wheel-type loaders sold or used in California on or after August 8, 1966, must be equipped with adequate seat belts and canopy guards, except when used on flat terrain.

New Warning Sign Required (SO 1768)

Still required is the following sign, posted in plain view of the operator and legible at a distance of 12 feet, on each crane derrick, power shovel, drilling rig, hay loader, hay stalker, pile driver, or similar apparatus, any part of which is capable of vertical, lateral, or swinging motion:

Unlawful to operate this equipment within 6 feet of high-voltage lines.

A new Order requires this *additional* sign:

All equipment shall be so positioned, equipped, or protected so that no part shall be capable of coming within 6 feet of high-voltage lines.

This should make it unmistakably clear that *no equipment may be placed in a position where any of its parts could POSSIBLY be swung to within 6 feet of high-voltage lines.*

Pneumatically Driven Nailers and Staplers (SO 1704)

New requirements include a safety device (on nailers and staplers operating at more than 100 psi pressure) to prevent the tool from operating if the muzzle is not in contact with the work surface, unless there is some device to prevent accidental discharge.

Before preparing Safety Order 1704, the DIVISION met with various manufacturers to discuss safety problems relating to these tools. An interesting by-product has been the formation of an organization of such manufacturers, to resolve common problems.

Powder-Actuated Tools (SO 1684-1692)

Revisions become effective on February 8th, 1966.

The revisions are based on regulations of the Powder Actuated Tool Manufacturers' Institute, of which almost all manufacturers of powder-actuated tools are members.

Operators must be qualified, and must pass a written examination approved by the DIVISION OF INDUSTRIAL SAFETY, which is authorized to demand surrender of an operator's card for cause.

Elevator Shafts to be Guarded (SO 1633)

All elevator shafts in which cages are not installed and which are not enclosed with solid partitions and doors must be guarded on all open sides by standard railings and toe-

boards.

Overhead protection must be provided at all times when people are employed in a shaft and other workmen are above them.

Floor, Roof, and Wall Openings (SO 1632)

The revised Orders contain new requirements for guarding of floor, roof, and wall openings.

One of them is that coverings of floor or roof openings must have a

sign warning against removing the covering.

This should reduce injuries and deaths from falls.

Concrete Equipment (SO 1698)

Handles on bull floats must now be constructed of nonmetallic and nonconductive material.

This will reduce the danger of the handle contacting electric wires.

Splendid Construction Film

We recently viewed what in our opinion is one of the finest safety films we have ever seen.

It is *Piping Safety*, a fast-moving 35-minute color sound film, sponsored by the Apprentice and Journeyman Training Trust Fund of the Plumbing, Heating, and Piping Industry in Southern California.

The film, which should be of value to the construction industry as a whole, dramatically depicts injuries resulting from unsafe conditions and unsafe work practices—not just in the piping trade, but in construction generally.

It emphasizes safe procedures, good housekeeping, and the safe use of hand tools.

The script was prepared by Vern Vihlene, the producer-director of the film, and Floyd W. Aldrich, Managing Director of the Apprentice and Journeyman Trust Fund.

Prints of the film are available at \$175 each from Vihlene Productions, 4063 Radford Avenue, Suite 211, Studio City, California.

The price includes reel, can, shipping container, and shipping charges to domestic or foreign destinations.

Frank L. Johnson Retires

Frank L. Johnson, who served the DIVISION OF INDUSTRIAL SAFETY well and faithfully as a Construction Safety Engineer for 23 years, retired from State service this past October.

A safety expert in the construction of dams and tunnels, Johnson covered many northern California power projects, and saw at first hand the tremendous increase in California construction in the past two decades.

An Alphabet of Industrial Safety

The most popular article in the CSN in the last fifteen or twenty years has been *An Alphabet of Industrial Safety*, which appeared in the September 1964 issue.

It has been reproduced in many periodicals in this country and abroad, and requests for permission to reprint it continue to arrive.

We shall reprint it in a future issue of the CSN.

Copies of the Construction Safety Orders, available in two sizes, are obtainable only from Documents Section, P. O. Box 1612, Sacramento, California 95807.

Bound copies, 4½" x 7½", are available for \$1.56, including tax.

Loose leaf copies, 6" x 9", are available for \$3.12, including tax.

Governor's Industrial Safety Conference—San Francisco, February 3-4

The 16th annual statewide meeting of the Governor's Industrial Safety Conference will be held at the Fairmont Hotel, San Francisco, on Thursday and Friday, February 3rd and 4th.

Some 1,400 to 1,500 persons are expected to be present at the two-day meeting.

Top-level management and labor will, as always, play a prominent role in the Conference—which will also be attended by other individuals, organizations, and agencies concerned with on-the-job safety in California.

Ernest B. Webb, Director of the DEPARTMENT OF INDUSTRIAL RELATIONS and General Chairman of the Conference, will call the general assembly to order at 10 a.m. February 3rd.

Geo. A. Sherman, Chief of the DIVISION OF INDUSTRIAL SAFETY and Secretary of the Conference, will follow with Conference announcements and general remarks.

The Conference program will be along the lines of those in the last few years—a format that has been extremely well received.

Registration will begin at 7:30 a.m. February 3rd in the main lobby of the Fairmont.

The general assembly will be featured by two major addresses—one by a speaker from labor, the other by a speaker from management.

Section Programs

The eight major industry-groupings that make up the Conference will hold separate section meetings on the afternoon of February 3rd and the morning of February 4th.

The various sections are preparing excellent programs for the February meeting, on a par with the highly informative and stimulating programs of recent years.

The programs, as far as they were arranged at the time of going to press, appear on the following page.

Conference Luncheon

A fitting finale to the Conference will be the luncheon at 12 noon, February 4th. The highlight will be an address by Governor Edmund G. Brown.

Tickets for the luncheon, which will be held at the Fairmont Hotel's Grand Ballroom, are \$4.25 each, including tax and tip.

They may be obtained by writing to GISC, Room 7224B, 455 Golden Gate Avenue, San Francisco, California 94102, and enclosing a check or money order made out to "GISC Luncheon."

Reserved tables for specific groups will be arranged only for groups of ten persons (or multiples of ten), accompanied of course by a remittance.

For the benefit of those who may not be attending the luncheon, the Governor's speech will be piped into the Grand Ballroom mezzanine room.

Educational Publications

The usual colorful exhibit will be displayed at the Conference, and will feature publications of the DIVISION OF INDUSTRIAL SAFETY and the DIVISION OF LABOR STATISTICS AND RESEARCH.

Special Message Center

Pacific Telephone will install a message center booth for the convenience of those at the Conference, with attendants on duty from 9 a.m. to 5 p.m. on February 3rd, and 9 a.m. to 3 p.m. on February 4th.

They will post the names of those receiving messages, and provide change for nearby coin telephones.

The message center booth phone number will be (Area Code 415) 781-4300.

Hotel Reservations

The Fairmont Hotel has reserved a block of rooms for Conference use.

Those planning to stay at the Fairmont are advised to make reservations with the hotel direct, without delay, and state that they will be attending the Conference.

Inquiries

Inquiries regarding the Conference may be made in San Francisco to Michael Flagg, the Conference Coordinator. (Phone: 557-2327)

In Los Angeles, to McKay Mitchell (DU nkirk 1-1291).

Construction Companies Disciplined by Contractors State License Board

Lentz Construction Co., a corporation, and Lentz Construction Corporation, a copartnership, both of 8580 Elder Creek Road, Sacramento, and George Warren Lentz, were disciplined by the Contractors State License Board for continued and repeated violations of Safety Orders over a fifteen-month period.

The long list of violations consisted of inadequate shoring of trenches; failure to

keep equipment at least six feet away from high-voltage lines, and absence of a warning sign to this effect in certain equipment; absence of a suitable fire extinguisher on boom-type excavators and cranes powered by electricity or an internal combustion engine; lack of guarding of sprocket chains located within seven feet of a floor or other working

level; inadequate access to and from excavated areas; and lack, on certain vehicles, of a warning device that operates automatically while the vehicle is backing.

The licenses of both companies and that of Lentz himself were suspended for 180 days, with the suspensions stayed for three years provided there are no further violations of Safety Orders and other safety regulations.

Outline of Section Programs at Forthcoming GISC

CONSTRUCTION SECTION

Thursday Afternoon

Safety in Underground Construction—Martin Kordick, President, Kordick & Son, Inc., and Director of Underground Engineering & Contracting Association

Insurer's Viewpoint on Job Safety Program—A. Melvin Anderson, Manager, Engineering Department, Industrial Indemnity Company

Construction Safety Orders Changes and Their Effects—Jack M. Valov, Supervising Construction Engineer, Division of Industrial Safety

Labor's Approach to Job Safety Program—Chester Bartelini, President, State Council of Carpenters

Friday Morning

Construction Safety Problems in Southern California—John A. Cinquemani, Executive Secretary, Los Angeles Building and Construction Trades Council

Three Leading Accident Types; What We Can Do About Them—a panel discussion.

Moderator: Arthur Eisele, Business Representative, Carpenters Union Local 1506

Roger M. Brennan, Executive Secretary, Building Trades Council of San Benito and Santa Clara Counties

James York, Safety Director, Gordon H. Ball, Inc.

Joe Murdoch, Business Manager, Laborers Local 300

John Barter, of Miller and Ames

FOREST PRODUCTS SECTION

Thursday Afternoon

Schedule Rate Guarding

Good Vision—Do You Have It?

Friday Morning

Accident Prevention in the Pulp and Paper Industry—a panel discussion

Wood Products Safety Problems—a panel discussion

Business Meeting

TRADES AND SERVICES SECTION

Thursday Afternoon

Safety Pays Off for the Restaurant Industries—a panel discussion

Agnes Bierwagen, Manager, Resident Hall Foods Service, University of California

Richard P. Bronson, President, Servomation Duchess, Inc.

Guy Leonard, General Manager of National Food Management Service, and Foster's Lunch System

Gary Nachmann, Vice President, Lyons-Magnus, Inc.

William O'Neill, City General Manager, B & G Foods, Inc.

John Pelton, Manager of Industrial Relations, Manning, Inc.

Dudley C. Steckmest, Manager, Commissary Division, Metropolitan Life Insurance Company

Friday Morning

Your Workmen's Compensation Program Today—Gordon R. Stark, Supervising District Representative, State Compensation Insurance Fund

Essentials for YOUR Accident Prevention Program—Arthur Frasco, Supervising Safety Representative, State Compensation Insurance Fund

MANUFACTURING SECTION

Thursday Afternoon

Occupational Disease Prevention and Control Services Offered by the Department of Public Health—Dr. Robert Johnson, Chief, Bureau of Occupational Health

Labor Unions and Plant Safety—Virgil L. Collins, Secy.-Treas. UAW Local 216

Environmental Engineering Services Available to California Industry—Walter Van Sandt, Industrial Hygiene Engineer, Division of Industrial Safety

Safety Incentives for Small and Large Employers—Norval McDonald, Chief Safety Engineer, Industrial Indemnity Company

Open Forum

Friday Morning

A Professional Safe Driving Training Program—

Stan A. Ossman, Director of Safety, Western Greyhound Lines

James H. Hall, Edex Corporation Drivex Manager

Open Forum

AGRICULTURE SECTION

Thursday Afternoon

Safety Through Education—a panel discussion

Motivation Through Modern Advertising Techniques—Edward Wilson, Vice President Foote, Cone & Belding

Motivation Through Formal Courses—Professor Emeritus Sidney S. Sutherland, Department of Agricultural Education, University of California at Davis

Motivation Through On-the-Job Training—Charles A. Kleinwachter, Safety Engineer, State Compensation Insurance Fund

Chain That Chain-Saw Accident! (Selection, use, and care of chain saws)—Ed D. Price, Safety Supervisor, Davey Tree Surgery Company, Ltd.

Getting Up in the World on Ladders (Selection, use, and care of ladders)—A. J. Ford, Assistant to Industrial Relations Manager, California Pacific Corporation

Friday Morning

How to Wire Safety Into Your Farm

Preventive Maintenance Pays Off

Operating Modern Farm Machinery—Miles W. Kratka, Manager, Agriculture Division, Riverside Cement Company

GOVERNMENTAL AGENCIES SECTION

Thursday Afternoon

How You Are Falling Down as a Boss—Irv Schnayer, Training and Safety Officer, County of Alameda

Sources of Help to Your Agency (Three safety sources described in detail)—Dan Hungerford

Business Meeting

Friday Morning

Personalizing Safety (Safety talks and accident investigations, used and abused)—Douglas R. Hollenberg

What Is Your Safety Problem?—a panel of the Executive Committee will answer questions

MINERAL INDUSTRIES SECTION

Thursday Afternoon

Mineral Industries Work Injury Estimates for 1965—Maurice I. Gershenson, Chief, Division of Labor Statistics and Research

Revised Pneumatic Loading of Explosives Safety Orders—J. R. Signer, Supervising Engineer, Mineral Industries Section, Division of Industrial Safety

Work Procedures and Safety—a panel discussion

Friday Morning

Piping Safety—a film

Truck Operations at Eagle Mountain—Harry M. Conger, Mine Superintendent, Eagle Mountain Mine, Kaiser Steel Corporation

Evaluating the MAC of Threshold Limits of Toxic Substances

TRANSPORTATION-COMMUNICATION-UTILITIES SECTION

Thursday Afternoon

Report on TCU Activities

Railroad Grade Crossing Protection—(with a film on the Predictor, one of the latest developments)—C. P. Darrough, Public Projects Engineer, Southern Pacific Company

Women in TCU Industries—Injuries and Workmen's Compensation—Emily Johnson, Referee, Industrial Accident Commission, California Department of Industrial Relations

Accident and Injury Prevention Through Physical Fitness and Medical Examinations—a panel discussion

Moderator: Lester Breslow, M.D., Director, California Department of Public Health

Dr. James S. Bosco, Associate Professor, Men's Physical Education Department, San Jose State College

Morris Collen, M.D., Kaiser Foundation Hospitals

L. R. Krasno, M.D., Cardiovascular Medico Services, United Airlines

Friday Morning

Psychological Aspects in Accident Prevention—Edward J. Stainbrook, M.D., Chief Psychiatrist, School of Medicine, University of Southern California

Open Forum

Boiler and Elevator Association Meets January 25-27

The latest developments in the construction, installation, and maintenance of boilers and elevators will be discussed at the 39th Annual Conference of the California Certified Boiler and Elevator Inspectors Association.

The three-day meeting will be held on January 25th, 26th, and 27th, at Del Webb's TowneHouse Motor Hotel, Market and 8th Streets, San Francisco.

Featured speakers include William C. Sturgeon, editor of *Elevator World*; George Holliday, Shell Development Co., Houston; and Elmer O. Peterson, Executive Director

of the National Board of Boiler and Pressure Vessel Inspectors.

Ernest B. Webb, Director of California's DEPARTMENT OF INDUSTRIAL RELATIONS, and Geo. A. Sherman, Chief of the DIVISION OF INDUSTRIAL SAFETY, will both address the opening session.

The exhibits and technical papers that will be presented should be of interest to designers, inspectors, and operators of boilers and elevators.

The meetings are open to the general public, with a registration fee of \$5 for non-members of the Association.

Boiler and Fired Pressure Vessel SO

On November 3rd, the Industrial Safety Board adopted two urgently needed additions to the Boiler and Fired Pressure Vessel Safety Orders.

One was the section of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code relating to nuclear vessels.

Virgil L. Collins on Industrial Safety Board

Virgil L. Collins of South Gate has been appointed by Governor Edmund G. Brown to the Industrial Safety Board.

Collins succeeds Albert G. Boardman, who was recently appointed by the Governor to the Industrial Accident Commission.

The other relates to water tube steam generators—a type of vessel now widely used in oil field thermal recovery operations.

A complete revision of the Boiler and Fired Pressure Vessel Safety Orders is in the offing.

Collins is Financial Secretary-Treasurer of Local 216 of the United Auto Workers, AFL-CIO.

Associated with that local for many years, he has an extensive background in labor-management relations and familiarity with industrial safety problems and their solution.

Dramatic Illustration of the Value of SO

Many lives have been saved by *General Industry Safety Order 3339*, which contains requirements to provide for the escape of those trapped in cold storage rooms.

The very latest case occurred in Sacramento recently, when three employees of a supermarket were locked in a walk-in freezer by robbers who held up the store.

There was no one to hear or see the electrically operated audible and visible signal (required by the Safety Order) that the trapped employees activated.

But means of freedom were available in the fireman's type axe in the cold storage room near the door, another requirement of the Safety Order.

Compliance with safety regulations certainly pays!

**Attend
the
February
Conference**

If You Move—

If you move, and wish to continue receiving the CSN, please notify us of your new address.

Accident Type and Agency, Disabling Work Injuries,^a California, 1964

Compiled by the Division of Labor Statistics and Research, California Department of Industrial Relations

Accident type	Total	Machines	Hoisting apparatus, conveyors, elevators	Vehicles	Hand tools	Chemicals, hot, injurious substances	Working surfaces	Ladders	Containers ^b	Lumber, logs, trees	Other agencies	Agency not reported
Total.....	182,173	15,066	4,714	23,422	17,382	8,318	32,903	5,004	17,643	6,258	48,546	2,917
Struck by or striking against.....	49,308	3,556	1,840	4,889	10,390	25	3,027	291	4,142	2,980	17,957	211
Caught in or between.....	13,392	7,300	1,386	1,695	364	—	55	38	386	209	1,954	5
Fall or slip.....	40,412	304	427	1,398	389	2	29,343	4,269	430	177	3,673	—
Accident involving moving motor vehicle.....	11,003	1	—	11,000	—	2	—	—	—	—	—	—
Strain or overexertion.....	45,625	2,437	956	3,395	3,893	14	456	396	12,580	2,333	18,120	1,045
Contact with temperature extreme.....	4,480	233	11	561	279	2,116	1	—	9	—	1,267	3
Contact with radiation, caustic, toxic or noxious substances.....	5,587	60	6	33	23	4,786	6	—	1	4	664	4
Contact with electric current.....	505	54	39	15	84	1	—	2	—	—	310	—
Explosion, flareback, etc.....	885	66	4	91	85	144	—	—	46	—	446	3
Foreign substance in eye.....	7,264	1,016	36	237	1,838	1,215	1	—	45	546	2,322	8
Other accident types.....	1,869	3	1	76	1	11	—	—	—	5	1,772	—
Accident type not reported.....	1,843	36	8	32	36	2	14	8	4	4	61	1,638

^a Disability causing absence from work for a full day or shift beyond the day of the injury.

^b Includes both filled and unfilled containers.

Recent Convictions for Violations of Safety Orders

Wilkinson & Co., of 4th and "F" Street, Wasco, pleading nolo contendere, was fined \$500, with \$400 of the amount suspended, and the company put on probation for three years, for placing a water well service rig in a position where it could come within 6 feet of a high-voltage line.

On August 4th, 1964, the rig did in fact contact the line. It resulted in the death of one employee, Paul Leroy Liles, and in serious burns to another, Lynn B. Allen.

Judge Gerald Davis of Bakersfield Municipal Court, Division A, rendered the verdict on October 11th, 1965.

Assistant District Attorney D. C. Maddock prosecuted.

C. N. Leinen, owner of Western Sanitation, Inc., was found guilty in the case of a crane operator who allowed a drill rig to contact a high-voltage line on November 20th, 1964.

The contact resulted in shock to an oiler, who also suffered burns on his hands and feet.

On March 23rd, 1965, Judge James M. McDonnell of Sacramento Municipal Court District, Department 1, imposed a fine of \$100 plus a 90-day suspended jail sentence.

Deputy District Attorney Daniel B. Lorenz prosecuted.

The September 1965 CSN reported the conviction on May 26th of A. T. Acrey,

doing business as Regent Pipe & Construction Company, 2412 Renegade Avenue, Bakersfield, for failure to protect workers against the hazards of moving earth on March 21st.

On September 14th, **Oscar Sargent, a job superintendent of that company,** was found guilty of violating Labor Code Section 6401 in connection with the same incident, and fined \$25.

Judge Donald A. Pollack rendered the verdict in Oxnard Municipal Court on September 14th.

Deputy District Attorney John Hunter prosecuted.

Labor Code Section 6401 states:

"Every employer shall furnish and use safety devices and safeguards, and shall adopt and use practices, means, methods, operations, and processes which are reasonably adequate to render such employment and place of employment safe. Every employer shall do every other thing reasonably necessary to protect the life and safety of employees."

Offices of the Division of Industrial Safety

The following is a list of main and field offices of the DIS.

MAIN OFFICES

SAN FRANCISCO	455 Golden Gate Ave.	557-1946
Los Angeles	3460 Wilshire Blvd.	381-5695

OTHER OFFICES

Bakersfield	225 Chester Ave.....	324-6473
Chico	341 Broadway	343-5182
Eureka	619 Second St.....	442-5748
Fresno	2550 Mariposa St.....	268-7151
Long Beach	230 East 4th St.....	432-8443
Merced	550 W. 22nd St.....	723-4561
Oakland	1111 Jackson St.....	834-3460
Redding	2115 Akard Ave.....	241-5100
Sacramento	1107 Ninth St.....	445-5818
Salinas	307 Soledad	424-4807
San Bernardino	478 West Base Line	884-6461
San Diego	1350 Front St.....	232-4361
San Jose	888 North First St.....	294-1525
Santa Ana	1619 W. 17th St.....	547-1603
Santa Barbara	411 E. Cannon Perdido.....	966-2918
Santa Rosa	750 Mendocino Ave.....	542-8802
Stockton	31 E. Channel St.....	463-2519
Ukiah	305 N. Main St.....	462-8850
Ventura	3418 Loma Vista Road.....	642-9679

Nature of Injury and Agency, Disabling Work Injuries,^a California, 1964

Compiled by the Division of Labor Statistics and Research, California Department of Industrial Relations

Nature of injury	Total	Machines	Hoisting apparatus, conveyors, elevators	Vehicles	Hand tools	Chemicals, hot, injurious substances	Working surfaces	Ladders	Containers ^b	Lumber, logs, trees	Other agencies	Agency not reported
Total	182,173	15,066	4,714	23,422	17,382	8,318	32,903	5,004	17,643	6,258	48,546	2,917
Amputations, loss of, paralysis	1,685	1,054	118	173	150	3	5	4	17	10	142	9
Burns and scalds	6,497	419	35	708	375	3,541	8	3	15	—	1,386	7
Cuts, lacerations, punctures, abrasions	30,824	5,414	777	3,004	6,975	98	3,332	392	1,477	976	8,158	221
Strains, sprains, dislocations, hernias	67,220	2,662	1,219	7,207	3,962	16	14,388	1,672	12,610	2,511	19,652	1,321
Crushing injuries	5,779	1,106	517	1,369	520	4	85	18	443	294	1,409	14
Fractures	16,053	1,248	685	2,841	969	8	4,467	911	748	526	3,571	79
Occupational diseases	6,422	174	40	224	206	3,268	255	35	193	46	1,883	98
Bruises and contusions	17,872	1,095	753	3,724	1,193	7	3,597	586	1,209	718	4,852	138
Other injuries	10,587	1,156	118	894	2,069	1,345	321	70	138	626	3,797	53
Nature not reported	19,234	738	452	3,278	963	28	6,445	1,313	793	551	3,696	977

^a Disability causing absence from work for a full day or shift beyond the day of the injury.

^b Includes both filled and unfilled containers.

Ni(CO)₄—MAC .001 ppm!

The above phrase means little to most of us.

But to the industrial hygienist, it means that *nickel carbonyl vapor*, Ni(CO)₄, is toxic (or harmful) to the human being if he breathes air which contains anything more than 1 part per billion *—.001 part per million, its MAC or maximum acceptable concentration.

Even the industrial hygienist, however, may well be amazed that any substance can be so extremely toxic.

He knows that one of our common liquids, carbon tetrachloride, whose vapor has an MAC of 25 parts per million, is a very harmful substance. An MAC of 25 is 25,000 times as great a concentration as nickel carbonyl's MAC of .001.

Can 1 part per billion * be measured?

Yes, by chemical analysis. A portable tracer gas analyzer can also do the job.

Nickel carbonyl, Ni(CO)₄, is a colorless, clear liquid which boils at 109° F. and starts to decompose at 122° F. It is a heavy liquid, having a specific gravity of 1.32.

Can a vapor which is harmful at the unbelievably low concentration of 1 part per billion * be safely processed in a commercial plant?

The answer is a positive yes.

Rohm and Haas of Houston, Texas, operates a nickel refinery, and, as part of the process, safely handles tons of nickel carbonyl each day.

G. H. Cummins of that company, in a paper presented before the Air Pollution Control Association, reviewing the safety that was designed and built into his company's nickel carbonyl plant, stated that it had allowed them to operate safely for four years without serious exposure to employees.

Some of the safety features presented by Cummins are as follows:

1. The pressure processing equipment, which operates at pressures of thousands of pounds, was designed for *double* the usual strength for the pressures and temperatures to be encountered.

2. The processing equipment is grouped as to type, with each group enclosed in a separate room or cell. Each cell has an electrically driven fan that changes the

air every 2 minutes. To assure a continuous air supply, each electric fan has a stand-by steam-driven turbine fan. In addition, each cell has air-circulating fans to eliminate dead spots.

3. The evacuated air from the cell fans is discharged into a furnace where the nickel carbonyl is decomposed.

4. Flanges are enclosed, and the air is evacuated.

5. Compressor stuffing boxes are enclosed and evacuated. Any evacuated nickel carbonyl is conducted to the same furnace as the air from the cells where the nickel carbonyl is decomposed.

Despite these and many other precautions, however, the company found, on first commencing operations, that employees were breathing harmful quantities of nickel carbonyl.

It then started the practice of having *all* employees wear a fresh-air supplied mask when entering a cell, regardless whether the equipment is operating or idle. Since then the company has had no further cases of toxicity.

The company has developed a method of urinalysis that effectively indicates body absorption of nickel carbonyl. It is standard procedure to test all employees who may have been exposed to vapors of nickel carbonyl.

In the early 1950's, 100 men in an oil refinery on the Gulf Coast were exposed to nickel carbonyl; 31 required hospitalization, and two died.

The symptoms of excessive exposure to nickel carbonyl are of two types, initial and delayed, but they may merge.

The initial symptoms may be frontal headache, weakness, partial instability of motion, tightness in chest, cough, shortness of breath, and nausea. These symptoms are rather mild, and the inhalation of fresh air may dispel them.

The delayed symptoms, which may appear as long as four days after exposure, are similar to the initial ones, except that they are more severe. Even death may result.

In the petroleum and petrochemical industries and some chemical industries as well, nickel is sometimes used as a catalyst.

However, it is only in the processes in which nickel is used at high pressures and elevated temperatures in the presence of carbon monoxide, that nickel carbonyl *may* be formed—in which case effective protective measures are necessary.

Except under such conditions, which are rare, nickel and its chemical substances are not harmful when processed.

They are of course not at all harmful when used in the form of commercial products, such as stainless steel containing nickel, and our much-handled five-cent coin, the nickel.

—Kyle J. Lutz, Safety Engineer
Division of Industrial Safety

* A thousand million, as in the American and French systems of numeration. In the British system, a billion is a million million.—Ed.

No Substitute for Safety Surveys!

Time and again has it been demonstrated that, regardless of all other safety activities, there is no substitute for on-the-job safety surveys made by DIVISION OF INDUSTRIAL SAFETY personnel.

Chief Geo. A. Sherman's article in the June 1965 issue of the CALIFORNIA SAFETY NEWS listed a few of the thousands of examples that could be cited.

Another dramatic illustration of the value of on-the-job safety surveys occurred in August.

A DIVISION safety engineer, checking a trenching job, discovered two laborers installing pipe in an unshored trench. Be-

cause of the imminence of the hazard, he required them to come out of the trench, and advised the foreman that no further work was to be done in it until adequate shoring was installed.

The foreman then left to obtain shoring lumber, the DIVISION engineer remaining at the site to make sure that the shoring would be properly installed.

A few minutes later, and before any shoring could be installed, a section of the trench caved in against the opposite bank—at a location where the laborers would probably have been had they been permitted to remain in the unshored trench.

Yours for the Asking

To those interested in accident prevention in industry, a number of publications of the DIVISION OF INDUSTRIAL SAFETY will be of value.

They are yours for the asking—free!

For obvious reasons, we do not send more than three complimentary copies of any brochure to anyone outside the State.

Bulletin 103, "Safe Handling of LP-Gas," gives the use and characteristics of LP-Gas, and the rules and standards that govern safe handling.

Bulletin 104 (Rev.), "Ground It!" explains the necessity and wisdom of grounding electrical hand tools.

Bulletin 106, "Ladders on the Farm," gives ladder pointers which, if followed, will reduce the high rate of disabling injuries caused by poor farm ladders and improper use of sound ladders.

Bulletin 107, "The Ship-Shape Shop," shows how good housekeeping and maintenance will save lives, limbs, and money.

Bulletin 108 (Rev.), "Taming the Circular Saw," deals with a most useful but dangerous wood-working tool.

Bulletin 110, "Tips for Hotel Workers," shows that hotel worker accidents are easily prevented if a few simple tips are followed.

Bulletin 111, "Farm Safety Check List," is a safety guide for everyone on the farm.

Bulletin 117, "Stop Grinding Out Injuries!" is about the abrasive wheel, and gives pointers which, if observed, will eliminate almost all grinding wheel injuries—of which over half are eye injuries.

Bulletin 120 (Rev.), "Safety Rules for Painters," tells you the four things that cause four out of five injuries to painters, and shows you how to prevent such injuries.

Bulletin 121 (Rev.), "Ladder Safety—Step by Step," shows that there is no bad luck about ladders when you observe three common-sense precautions.

Bulletin 122, "Handy Rules for Hand Tools," describes the proper care and use of such tools as files, screwdrivers, wrenches, chisels, hammers, knives, and handsaws.

Bulletin 124 (Rev.), "Safety Rules for Roofers," analyzes roofer injuries in a 12-month period and tells how to prevent them.

Bulletin 125 (Rev.), "Are You Using Carbon Tet?" deals with a chemical that has caused work injuries and deaths.

Bulletin 127, "Look Out for Yourself If You Are Around Crop Spraying," an illustrated booklet directed to the farm worker himself, explains how pesticides can be used safely. (Available in Spanish also.)

Bulletin 128, "If You Work in a Quarry," is for the quarry and open pit mine worker, and points out the things he should keep in mind.

Bulletin 133, "Analysis of California Logging and Sawmill Fatalities," contains a study of logging and sawmill deaths in California, and an injury-prevention program.

Bulletin 135 (Rev.), "Check List of Requirements," a guide for employers, safety engineers, and purchasing agents, shows what they should check for before buying or renting equipment or placing contracts.

Bulletin 137, "Skin Trouble Is Plenty Trouble," deals with the most common disease you can get at work.

Bulletin 138, "Supervision and Explosives Accidents," analyzes explosives injuries in California in a three-year period.

Bulletin 140, "Keep AWAY From Power Lines!" is for any and all workers whose jobs may expose them to the hazards of overhead electric power lines.

Bulletin 141 (Rev.), "Power Hand Saw Safety," gives common causes of power hand saw injuries, and tells how to stop them.

Bulletin 142, "Read and Understand the Label!" reminds us how vitally important it is to read and understand the labels of containers of hazardous chemical and mixtures.

Bulletin 143, "Trade Association Safety Programs," shows the value of such programs and what they can do for you.

Bulletin 144, "The Know-How of Wire Rope Safety," gives information that the man on the job and his boss should know.

Bulletin 150, "Electrical Safety and Swimming Pools," describes precautions that would make swimming pools safe electrically.

Bulletin 151, "Control of Noise in Industry," emphasizes the need for either eliminating or controlling excessive noise, and gives practical methods for doing so.

Bulletin 153, "Electrical Safety on the Farm," points out the many electrical hazards encountered on the farm, and tells how to guard against them.

Bulletin 154, "The Tailgate Safety Meeting," gives pointers on an effective means of promoting on-the-job safety.

Bulletin 155, "Pesticide Regulations," tells how to guard against hazards in the use of poisonous and toxic pesticides containing organic phosphates.

Guard Standards, No. 1, Materials and Construction, gives invaluable advice on constructing guards and selecting the right materials for them.

Guard Standards, No. 2, Stairways and Railings, gives requirements for stairways, railings, entrances to stairways, and floor and wall openings.

Form 634, an 8½" x 11" placard. Safety Responsibilities—Employer and Employee— prescribed in Labor Code. (Available in Spanish also.)

Available Reprints include

Power Press Safety

Transportation of Workers—Current California Regulations

Lifting With Safety (Limit within California: 100 copies for any organization, one copy for any individual)

Several construction bulletins, omitted from this list, are being amended in the light of the recently revised Construction Safety Orders.

Safety Orders Available at Documents Section

The following Safety Orders are available from Documents Section, P.O. Box 1612, Sacramento, California 95807.

Where Safety Orders have been revised (as almost all of them have been), the date is the date of the latest revision.

	Price	With sales tax
Aerial Passenger Tramway Safety Orders (1956).....	\$0.50	\$0.52
Boiler and Fired Pressure Vessel Safety Orders (1955).....	.50	.52
Compressed Air Safety Orders (1946).....	.50	.52
Construction Safety Orders (1965) bound 4½" x 7½".....	1.50	1.56
in loose-leaf form 6" x 9".....	3.00	3.12
Electrical Safety Orders (1962).....	1.50	1.56
Elevator Safety Orders (1954).....	1.00	1.04
General Industry Safety Orders (1963).....	1.00	1.04
Logging and Sawmill Safety Orders (1958).....	1.00	1.04
Mine Safety Orders (1958).....	.75	.78
Petroleum Safety Orders—Drilling and Production (1959).....	1.00	1.04
Petroleum Safety Orders—Refining, Transportation and Handling (1951).....	.75	.78
Pneumatic Explosives Loading Safety Orders (1944), Quarry and		
Open Pit Mine Safety Orders (1953).....	.75	.78
Ship and Boat Building Safety Orders (1961).....	.50	.52
Tunnel Safety Orders (1962).....	.75	.78
Unfired Pressure Vessel Safety Orders (1964).....	.75	.78
Window Cleaning Safety Orders (1952).....	.50	.52

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GC

From
DEPARTMENT OF INDUSTRIAL RELATIONS
DIVISION OF INDUSTRIAL SAFETY
455 GOLDEN GATE AVENUE
SAN FRANCISCO, CALIF., 94102

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SIX-MONTH BOX SCORE

Disabling Work Injuries and Deaths ^a in California

Month	Disabling Work Injuries			Deaths ^a		
	1965	1964	1963	1965	1964	1963
January	14,403	14,534	14,437	73	63	43
February	14,156	13,911	12,622	42	60	48
March	15,860	16,066	13,289	48	56	57
April	14,025	15,514	14,157	51	62	57
May	15,315	14,944	13,520	62	56	58
June	14,965	15,023	13,352	64	64	36
6-month total	88,724	89,992	81,377	340	361	299

Injuries down 1.4% from 1964

Employment up 3.0% from 1964

^a In January 1964 the definition of a "work fatality" for statistical purposes was revised to exclude all compromise and release settlements, except where the sole issue was dependency. Monthly fatality totals for 1963 have been revised to conform to the new definition.

(Source: Division of Labor Statistics and Research)

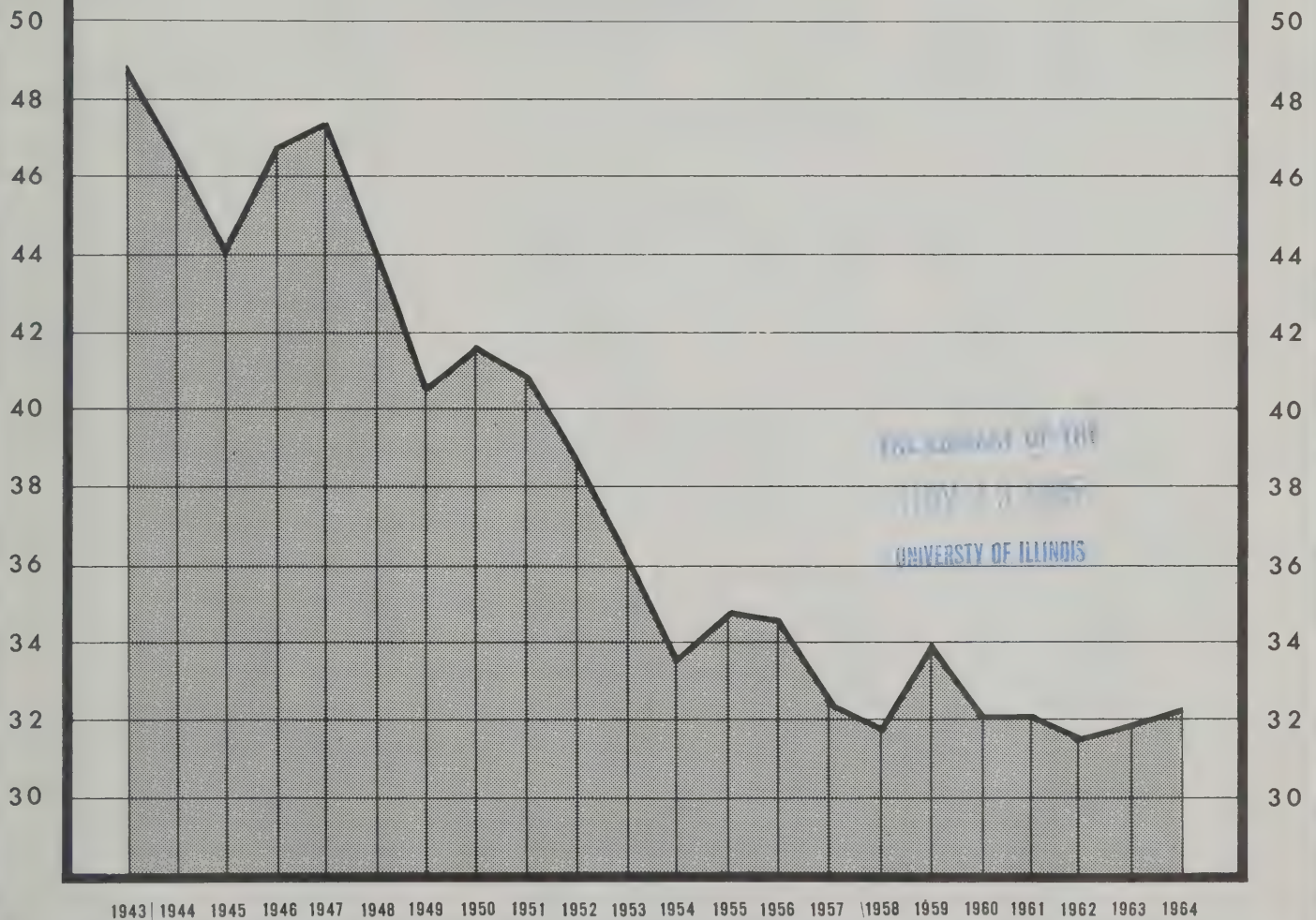


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Disabling Work Injuries Per 1,000 Workers, California, 1943-1964



California Safety News

Vol. 49, No. 3, September 1965

The California Safety News is mailed free of charge to those interested in industrial safety

Safety Orders—Their Wider Application

Over the years, California courts have made it abundantly clear that Safety Orders of the DIVISION OF INDUSTRIAL SAFETY, though designed primarily for the protection of employees, can be applied as standards for the protection of the general public.

This philosophy goes back as far as 1924, when the State Supreme Court noted that safety surveys by the DEPARTMENT OF INDUSTRIAL RELATIONS (of which the DIVISION is a part), may, under proper circumstances, be directed to the safety of others besides employees.

The Supreme Court stated then that the periodic inspection of elevators required by law is *"to the end that the public generally, as well as employees in the building where elevators are used, might have additional protection against injury or loss of life."*

In the intervening forty-one years, this concept has been reaffirmed time and again.

In an interesting case some years ago, a woman shopper was hurt when she fell on a stairway in a department store. The stairway, which was 96 inches wide, had no center handrail, thus violating a Safety Order of the DIVISION OF INDUSTRIAL SAFETY requiring stairways 88 inches or more in width to have a center railing.

The Supreme Court then (1957) observed: "Some safety orders, such as those regulating machinery, might be regarded as peculiarly designed to protect employees when applied to places of employment which the public is prohibited from entering. An entirely different situation, however, is presented where, as here, a person is a business invitee in a department store and is using a stairway which the store provides for persons in her position as well as for employees."

These reflections are inspired by two bills enacted into law by California's Legislature in 1965.

One, reported in the June issue of the CSN, requires a switch in certain types of elevator cars to bypass the photoelectric tube device that normally controls the closing of the doors.

The other makes for greater safety in ski-lift operations.

In both cases, the general public and workers will alike enjoy the benefit of greater safety.



In This Issue...

There always are new hazards to control, but we find *In the Main—the Same Old Problems*. Page 8

Turn to Page 11 for 1964 figures of *Disabling Work Injuries by County and Industry Division*.

Page 14 contains a list of some *Recent Convictions for Violations of Safety Orders*.

The facing page will give you a good glimpse of *Your Division of Industrial Safety*.

An interesting reprint will, we hope, get you to start *Training Your Subconscious*. Page 10

New safety laws are in the books. One on *Motor Vehicle Pollution Control* is on Page 9; the other, making for *Greater Ski-Lift Safety*, on Page 8

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Your Division of Industrial Safety

The DIVISION OF INDUSTRIAL SAFETY, which is part of the DEPARTMENT OF INDUSTRIAL RELATIONS, is the state agency that has jurisdiction over on-the-job safety in California.

And whether you are employee or employer, the DIVISION can help you in many ways.

The DIVISION exists for *your* benefit.

The Legislature gives the DIVISION not only the jurisdiction but the broad powers necessary to enforce safety in almost all jobs and places of employment in California.

The only exceptions are ships' crews on board ship; federal employees, military and civilian; operating employees of interstate railroads; and household domestics. The first three groups are under other safety jurisdictions.

Some Responsibilities of DIS

The DIVISION's responsibilities are many. Among other things, it

- enforces laws and lawful Orders requiring work and work places to be safe;

- investigates work injuries and deaths;

- checks to see whether work places are safe;

- prepares Safety Orders (standards of safety) which, if adopted by the Industrial Safety Board, have the force and effect of law;

- establishes special orders, or rules and regulations to cover a specific individual place of employment or process of work;

- examines, tests, and approves (or disapproves) certain types of equipment, if approvals are required before the equipment may be used.

The Labor Code *requires* the DIVISION to enforce all Safety Orders, and to check whether work places are safe.

The DIVISION does this by injury-prevention surveys of places of employment; and it reaches as many places as it can.

Safety Orders

California's Safety Orders for industry are recognized as the finest in the Nation. The State has always refused to be satisfied with standards merely because they are accepted elsewhere, and consistently strives for just and reasonable standards of safety.

With more than 400,000 places of employment in California, the DIVISION cannot, with its small staff, cover *all* places.

So the DIVISION concentrates its efforts mainly on the more hazardous industries and occupations.

In its injury-prevention surveys, the DIVISION

- sees whether a place of employment complies with standards of safety in Safety Orders, and writes requirements to correct violations;

- checks for imminent hazards to employees;

- tries to find, and reports, better methods and developments in on-the-job safety.

Other Services of the Division

The DIVISION feels that the overwhelming majority of employers *want* to have a safe place of employment, but may not know exactly *how* to make their work places safe.

So the DIVISION offers a number of services to all levels of management, and of course labor as well. Here are some of them.

It gives talks to foremen and employees on specific subjects.



Geo. A. Sherman, Chief
Division of Industrial Safety

It helps employers and labor unions organize safety programs.

It permits variations from Safety Orders *if there is good reason, and if at least equal safety is provided.*

It reviews (if asked) plans and specifications of new facilities, to check whether they conform to requirements. (This helps to avoid expensive alterations later.)

It offers more than fifty brochures on specific on-the-job hazards and means of protection against them.

It offers the CALIFORNIA SAFETY NEWS, a free quarterly publication featuring solutions of work safety problems.

It displays educational safety materials at conferences and conventions, and at meetings of union and employer organizations.

It takes active part in the Governor's Industrial Safety Conference, and in regional safety meetings during the year.

It maintains a safety library—available to the public—that is the finest source of work safety information in California.

Special Drives

During high activity periods in industries having a high rate of injuries, the DIVISION concentrates more manpower than usual in those industries. →

The DIVISION also, from time to time, directs greater efforts on special problems that are revealed by statistics or field surveys as needing special attention.

These special drives have been conducted with notable success, bringing a significant decline in the work injury rate in many fields. As a result, much greater safety has been achieved in logging and sawmills, power punch presses, transportation of workers, powder-actuated tools, and cotton gins, to name some areas.

Complicating Factors

The DIVISION's task is complicated by many factors.

One is the continuing phenomenal increase in California's population, which has soared from 7½ million in 1940 to more than 18 million in 1965.

Another is the tremendous growth of California industry, old and new, in both defense and non-defense fields, with the employed civilian labor force increasing from roughly 2½ million in 1940 to almost 7 million in 1965.

A third factor is the size and varied geography in California.

Decentralization

The DIVISION has only about 230 safety engineering positions on its staff, despite the magnitude of its task.

To make the best possible use of them, and to thus render better service to the people of California, the DIVISION has decentralized its activities.

This has been done by having engineers work out of not only the headquarters office in San Francisco and the regional office in Los Angeles, but out of many field offices throughout the state.

Division Sections

The DIVISION works through the following eight sections, each manned by specialists in its own field.

Construction Section
Educational Section
Electrical Section
Elevator Section
Environmental Engineering Unit
Industrial Section
Mineral Industries Section
Pressure Vessel Section

Besides their specific individual functions, the DIVISION's technical sections have many common duties.

They are, for instance, all available for consultations; they all (when required) examine, test, and approve or disapprove equipment; and they all determine whether variations from Safety Orders should be permitted.

The DIVISION's Labor Liaison Representative is its direct contact man with organized labor.

He assists in the handling of union complaints, and helps to provide safety information to labor.

Construction Section

This Section, concerned mainly with the safety of workers employed by construction contractors and subcontractors, surveys job sites to check for hazards and to see that hazards are either eliminated or controlled.

Construction is considered to include highway projects, tunnel driving, and pipeline work, as well as building construction and specialty contracting such as plumbing, painting, and sheet metal work.

The Construction Section also enforces the Window Cleaning Safety Orders.

While the Section is mainly concerned with projects during their construction phase, it is also concerned with the repair of completed projects and with the enforcement of Safety Orders that affect the design of new structures.

Electrical Section

The Electrical Section is responsible for seeing that all places of employment are safe electrically.

This means that the Section covers almost all places of employment, as the use of electricity is practically universal.

The DIVISION's Electrical Safety Orders are the *minimum* electrical standards for places of employment.

The Section works closely with electrical contractors, electrical engineers, unions, inspectors associations, and city and county authorities.

Elevator Section

As required by law, the Elevator Section is responsible for seeing that every elevator in California is inspected at least once a year, and for issuing a one-year operating permit for each elevator found to be safe.

This applies also to all dumbwaiters, manlifts, escalators, and aerial passenger tramways.

It is impossible, however, for the few engineers in the Section to do all the required inspections themselves; and so most of the *reinspections* are made by certified elevator inspectors employed by insurance companies.

These inspectors are not only trained and examined by the DIVISION's Elevator Section, but supervised by it.

All elevator inspections and reinspections in the City of Los Angeles are performed by certified elevator inspectors employed by the City.

These inspectors are examined and certified by the City if they pass examinations prepared by the DIVISION.

No new elevators, dumbwaiters, escalators, manlifts, and aerial passenger tramways may be installed unless the plans for installation are approved by the Elevator Section.

Industrial Section

The DIVISION's largest section is the Industrial Section, which checks the safety of every industry and occupation not specifically covered by any other DIVISION section.

This of course covers a wide field—from the manufacture of pins to the manufacture of aircraft; from the threading of a needle to the felling of giant redwoods.

Some of the main fields among the hundreds that the Industrial Section covers are: agriculture, clothing, chemical, cotton, food and processing, iron and steel, leather, lumber and wood products, metal fabrication, metal stamping and forming, motion pictures, paper, printing, rubber, ship and boat building, textiles, trades, services, governmental agencies, and transportation.

Mineral Industries Section

The Mineral Industries Section covers mineral industries and related industries, including all mining; rock and gravel pits, except in connection with construction projects; oil fields and refineries; water well drilling; some explosives manufacturing plants; and manufacture of some concrete and clay products such as concrete building blocks, concrete pipe, and clay, brick, and tile.

Special activities of the Section include dust and gas investigations, ventilation surveys of un-

derground mines, and safety supervision of underground mine fire fighting and rescue.

Pressure Vessel Section

The Pressure Vessel Section has specialists in the construction, maintenance and repair of pressure vessels, both fired and unfired.

With few exceptions, the law requires every boiler, air tank, and LP-Gas tank to be inspected periodically, and, if safe, to receive an operating permit.

As with the Elevator Section, most inspections are done by inspectors of insurance companies and municipalities, who are trained, examined, and, if qualified, certified by the DIVISION.

The Section works with design engineers, inspecting boiler and pressure vessels during construction to make sure that they conform to applicable codes.

If the manufacturer wishes, the Section will make a shop inspection of vessels during construction, and, when the vessels are satisfactorily completed, certify them as complying with standards.

At present, an average fee of about \$4 an hour is charged for shop inspections. An increase has been authorized by the Legislature.

The Section's safety jurisdiction also includes the construction and maintenance of atomic reactors.

Educational Section

The Educational Section has the responsibility of fostering and encouraging on-the-job safety through a wide variety of educational means.

One of the Section's main objectives is the education of employers and employees on specific hazards, and on how these hazards can be eliminated or controlled.

It does this through various mediums, such as

- the California Safety News
- special brochures on specific hazards
- Division exhibits at conventions, conferences, and other meetings
- press releases
- trade journals
- special reports
- the Governor's Industrial Safety Conference

Environmental Engineering Unit

The Environmental Engineering Unit provides information and advice to labor and management on occupational health problems, and assists the various sections of the DIVISION in administering Safety Orders relating to industrial hygiene, control of hazardous substances, and ionizing radiation.

The Unit works closely with the Coordinator of Atomic Energy Development and Radiation Protection in the Governor's Office, the State Department of Public Health, the U. S. Atomic Energy Commission, and other agencies and organizations concerned with occupational health.

Since September 1962, the DIVISION, through the Environmental Engineering Unit, and California's Department of Public Health have assumed much of the licensing and regulatory functions previously performed by the Atomic Energy Commission.

The DIVISION is responsible for precicensing evaluations and inspections of industrial plants desiring to use radioactive materials.

Remember This

The DIVISION is guided by one single aim: *making California's work places safe for everyone.*

If you have any safety problems of any sort, the DIVISION will gladly help you.

Remember, it is *your Division of Industrial Safety.*

Don't Set Man-traps!

The old adage that everything may not be as it appears is particularly applicable to the construction industry with its endless variety of temporary work conditions.

A good example of this is seen in the accompanying pictures, which show a scaffold platform covered with cardboard to catch dropping plaster.

In this case, the cardboard covered not only the scaffold planks but adjacent areas where there were *no* planks.

When a workman stepped on one of these areas he fell through the cardboard—see picture on the right—and was badly injured by the fall to the concrete floor below.

A good rule to follow is this:

Don't cover openings in scaffolds, or elsewhere, with material which will not sustain workmen, no matter how suitable the material may be for other purposes.

To do so is to set a trap to catch a man.



Stiffer Penalties for Gross Negligence Resulting in Death

Many are apparently still unaware of the existence of Labor Code Section 6416, enacted by California's Legislature in 1963.

Except where still severer penalties are provided in the Labor Code, *Section 6416 increases both the length of the jail sentence and the amount of fine for employers whose gross negligence on on-the-job safety results in death to an employee.*

The maximum limit for imprisonment in the county jail is increased from six months to *one year*.

Fines are increased from \$500 to a fine of *not less than \$1,000 nor more than \$5,000*.

Assembly Bill No. 1799, which in 1963 added Section 6416 to the Labor Code, also added Section 7109.5 to the Business and Professions Code.

In effect, Section 7109.5 reaffirms and strengthens the authority of the

Department of Professional and Vocational Standards to suspend the licenses of certain employers—those under their licensing jurisdiction—who fail to take required measures for the safety of workmen.

The Section makes any violation of Safety Orders of the DIVISION OF INDUSTRIAL SAFETY that results in death or serious injury “a cause for disciplinary action” by the Department of Professional and Vocational Standards.

They Needn't Have Died!

The following cases were taken from a file of injury reports.

The Accident	The Result	The Unsafe Act	The Unsafe Condition	To Prevent Such Deaths
A truck driver who climbed into the back of a garbage collection truck without first shutting off the power, was caught by the compressing blade.	He was crushed to death.	Failing to shut off the power before entering.		Make sure employees realize the importance of locking controls in the "off" position before work on dangerous equipment. (<i>General Industry Safety Order 3276b</i>)
A deck hand was painting the control mechanism for a vehicle ramp of a ferry slip while a ferry was docking. His arm was caught in the unguarded revolving drum of the machinery, and he was catapulted 25 feet to the ramp below.	He was killed.	Working on moving machinery.	The unguarded control mechanism.	Guard drive shafts and drum assemblies, as required by <i>General Industry Safety Orders 3521 and 3517a</i> .
An electrician's helper slipped and fell while cleaning a rectifier that was not completely enclosed. His head was nearly severed by the rectifier disc.	He was killed.	Failing to padlock the main switch in the "off" position before entering rectifier enclosure.	Incomplete enclosure of rectifier.	Guard all hazardous revolving or reciprocating parts in any machine not guarded by the frame of the machinery, as required by <i>General Industry Safety Order 3517a</i> . Impress workers with value of "lock out" rule.
As an auto mechanic was working under a car (on support blocks) with the motor running, the car suddenly lurched backwards and fell off the jacks.	He was crushed by the car, and died from injuries.	Failing to adequately support and secure the car.		Instruct employees to effectively block or otherwise secure equipment that is capable of movement, if there is a hazard to employees while repairs are being made. (<i>General Industry Safety Order 3276d</i>)
While loading 30-foot aluminum pipes onto a truck that was directly under a high voltage line, a farm laborer upended one pipe to dislodge dirt from it. The pipe hit the line.	He was electrocuted.	Raising aluminum pipe near high voltage lines.		Impress workers with the importance of not letting anything they handle come anywhere near high voltage lines. <i>Electrical Safety Order 2603b</i> expressly bans such operations.
While an apprentice carpenter was using a swing cut-off saw that was not adequately guarded, the blade came off the arbor, spun across the saw table, and struck him in the chest.	He was killed.		The inadequate guard.	Make sure that swing cut-off saw blades are encased on both sides in such a way that at least the upper half of the blade and the arbor end are completely covered, as required by <i>General Industry Safety Orders 3630a</i> .
A backhoe operator, working alone, left his machine to enter an unshored and unsloped trench six feet deep. A cave-in of earth buried him.	He was killed.	Entering an unshored and unsloped trench.	The unshored and unsloped trench.	Make sure that workers do not enter any unshored trench unless it has been determined that there is no hazard of moving ground.
As a laborer was holding the handle of a loaded concrete bucket to guide it into position, the crane operator allowed the crane boom to touch a high voltage overhead line.	The laborer was electrocuted.		Equipment near high voltage lines.	Set up the job by the use of boom snubs or similar positive devices, to prevent contact of equipment with high voltage lines.
A scaler (equipped with safety belt and lifeline) was removing loose rock from the face of a sloped bank of a highway cut. As he was barring or prying loose material above him, he was struck by rock that was dislodged.	He was killed.	Barring or prying loose material above him, instead of below him or to one side.		Closely supervise all scaling operators, and instruct men never to bar or pry materials above them.

In the Main—the Same Old Problems

In his article *Where Greater Safety Efforts Should Be Concentrated* (December 1963 CSN), Geo. A. Sherman, Chief of the DIVISION OF INDUSTRIAL SAFETY, had this to say:

It is *not* the newer fields that demand our *major* attention (though attention to newer fields is of course needed also).

For work injury figures show that our main problems today are virtually the same as they have been in the past—as far as the majority of injuries is concerned.

Falls and slips, strain or over-exertion, striking against objects or being struck by them—*these*

are the major accident types that cause roughly 3 out of every 4 injuries to California workers.

Figures from the DIVISION OF LABOR STATISTICS AND RESEARCH, which began compiling comprehensive work injury statistics twenty years ago, bear this out.

The figures for 1964 are no exception, as the accompanying table reveals.

It shows, in addition, *that the proportion holds true not only for industry as a whole, but for the various major industry groupings themselves.*

What is equally interesting is that in individual industries

within major industry groupings, about the same proportion appears to exist.

This is illustrated by the recently prepared booklet, *Injuries in Wholesale Bakeries, California*.*

Of 675 disabling work injuries recorded in that industry in a 12-month period, the three major accident types caused 72%.

The moral seems plain.

"It is in these major . . . areas that intensive and unremitting safety efforts can pay off handsomely. And it is to these areas that safety personnel could well devote a greater part of their efforts."

* Available from the DIVISION OF LABOR STATISTICS AND RESEARCH, P.O. Box 965, San Francisco, California 94101.

Legislature Provides for Greater Ski-Lift Safety

Provisions for greater safety of aerial passenger tramways—"ski-lifts"—were enacted into law by the passage of Assembly Bill No. 1295 at the recent session of the California Legislature.

The Bill, which was introduced by Assemblyman John C. Williamson, adds Sections 7340-7355 inclusive to the Labor Code. It was signed by Governor Edmund G. Brown in July.

An *aerial passenger tramway* "includes any method or device used primarily for the purpose of transporting persons by means of cables or ropes suspended between two or more points or structures."

The Legislative Counsel's digest of the bill is as follows:

Requires that no aerial passenger tramway shall be operated in any place of employment without a permit from the Division of Industrial Safety.

Makes violation a misdemeanor.

Authorizes the division or any person affected thereby to seek an injunction restraining the operation of any such tramway operated without a permit and which is in such condition that its use is dangerous.

Requires the division to inspect such tramways once each year and issue a yearly permit for tramways found safe.

Authorizes the division to require repairs or alterations to be made upon unsafe tramways, and to order the discontinuance of unsafe tramways, after hearing, if requested.

Authorizes the division to fix and collect inspection fees not to exceed certain specified amounts, to be paid into the General Fund.

Authorizes temporary permits under specified circumstances.

Provides that no tramway shall be constructed without approval by the division of the erection plans and design information which shall be certified by a qualified engineer and that no permit to operate a tramway shall be issued until a qualified engineer certifies that the erection work on the tramway has been completed in accordance with the design and erection plans.

Provides that nothing in the provisions shall limit the authority of the division to prescribe or enforce general or special safety orders.

Letters to the Editor...

We have had an opportunity to review some of your bulletins . . . and find them to be excellently prepared and edited for ready reference and application.

—H. E. Nordlund, Manager, Engineering
Safeco Insurance, Seattle, Washington

Recently a copy of the CALIFORNIA SAFETY NEWS came to my attention and I would like to be placed on your mailing list for 10 copies . . . to be distributed to our various city departments.

—Paul F. Hughey, City Manager, City of Martinez

We find these bulletins (DIVISION OF INDUSTRIAL SAFETY publications) of immense value . . . You're to be truly complimented for the excellence of those publications and for the fine material published in the CALIFORNIA SAFETY NEWS.

—Charles F. Kircher, Commercial Lines Underwriting
Manager, Farmers Insurance Group, Santa Ana

Thank you very much for . . . the CALIFORNIA SAFETY NEWS. This publication has been very useful for my work.

—Alvarado Prado C., Head of Safety Department
Empresa Nacional Del Petroleo, Chile

I wish to take this opportunity to inform you that I enjoy reading the CALIFORNIA SAFETY NEWS very much.

—T. D. Reed, District Safety Director
Lumbermens Mutual Casualty Co., Los Angeles

DISABLING INJURIES CAUSED BY THREE LEADING ACCIDENT TYPES, California 1964

	Disabling injuries	Struck by or striking against	Fall or slip	Strain or overexertion	Three leading accident types	
					Number of injuries	Percent of total injuries
TOTAL	182,173	49,308	40,412	45,625	135,345	74%
Agriculture	16,022	3,864	3,761	3,458	11,083	69%
Mineral Extraction	2,043	647	371	407	1,425	70%
Construction	28,209	8,519	7,431	6,556	22,506	80%
Manufacturing	45,060	12,917	7,356	11,337	31,610	70%
Transp., Comm., Util.	15,254	3,562	3,449	4,314	11,325	74%
Trade	34,034	10,175	7,043	9,010	26,228	77%
Finance, Insurance, Real Estate	2,435	501	929	492	1,922	79%
Service	17,468	4,409	4,466	4,366	13,241	76%
State and Local Government	21,599	4,705	5,593	5,673	15,971	74%
Industries not reported	49	9	13	12	34	

Motor Vehicle Pollution Control

(New law on unregistered motor vehicles in buildings)

In July, Governor Edmund G. Brown signed Assembly Bill No. 1031, introduced by Assemblyman Tom Carrell and coauthored by Senator Thomas M. Rees.

Enforcement of the provisions of the bill, which adds Sections 6418 and 6419 to the Labor Code, is delegated to the DIVISION OF INDUSTRIAL SAFETY.

The two sections are as follows:

6418. It shall be the duty of the division to determine by August 1, 1966, the maximum allowable standards of emissions of contaminants from unregistered motor vehicles that are used inside factories, manufacturing plants, warehouses, buildings and other enclosed structures, which standards are compatible with the safety of employees.

The standards shall be developed after the division has held public hearings and afforded an opportunity for all interested persons to appear and file statements or be heard. The division shall publish such notice of the hearings as it determines to be reasonably necessary.

The division after notice and hearing may revise the standards, and shall publish the revised standards, from time to time.

6419. All motor vehicles exempt from registration under the Vehicle Code that are used inside factories, manufacturing plants, warehouses, buildings and other enclosed structures may be equipped with a certified exhaust purifier device within one year after the certification is made by the Motor Vehicle Pollution Control Board. This section shall not apply to any such motor vehicles that are powered by electricity.

The Division of Industrial Safety shall be responsible for the enforcement of the provisions of this section.

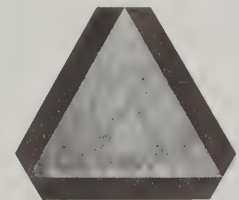
The DIVISION is collecting necessary information before preparing proposed standards.

The usual thoroughly democratic process of establishing Safety Orders in California will be followed, including research and study; preparation of a first draft of the proposed Orders; committee meetings of interested groups and individuals; full discussion of the problem; study of all opinions; and public hearings before the Industrial Safety Board.

Slow Moving Vehicles

Backed by 3 years of research and by 2 years of field study, several national safety organizations have recommended a new, unique emblem to identify *slow moving vehicles*.

Regardless of whether you are an operator of slow-moving vehicles on the highways, or a motorist who may encounter a SMV, this emblem will help protect you.



During daylight, when 9 out of 10 slow-moving accidents occur, the bright fluorescent orange of the center of the emblem shown above, is the most visible color available.

It gains the attention of approaching motorists at distances exceeding one-fifth of a mile, and they thus have ample time to slow down *before* it is too late.

At night, the reflective red border of the emblem glows brilliantly in the path of approaching auto headlights.

Every motorist should be on the lookout for this emblem, and every operator of a slow-moving vehicle should use it.

—Safety Review, Office of Industrial Relations,
Navy Department, Washington, D.C.

Training Your Subconscious

An interesting article under this title, by C. A. Merritt of *Michigan Mutual Liability Company*, appears in the July 1965 issue of that company's publication, *The Michigan Mutual Shop Man*.

In reproducing virtually the entire article, *the emphasis throughout is ours*.

Saying that people can help themselves to overcome proneness to certain kinds of accidents by *training their subconscious*, Merritt adds:

But first of all, the tendency toward accidents—whether a single kind or several types—must be recognized either by the person himself or by his associates.

Someone who repeatedly falls down stairs or rear-ends automobiles had better stop to take inventory of his habits.

The do-it-yourself carpenter who mashes his thumb three times had better nail down some other points before continuing his work.

As not every accident results in injury or damage, Merritt goes on to say, we must be alert to recognize repeated situations that are likely to result in accidents.

The driver who habitually "stands" on his brakes to avoid hitting the car ahead, and consequently jolts his passengers, is just around the corner from a real accident.

The maintenance man who thoughtlessly leaves a wrench or crowbar on the bed of a punch press, only to have it knocked "harmlessly" to the floor, is an accident waiting to happen.

Once we recognize the proneness toward accidents, it's time to enlist three important helpmates: Attitude, Knowledge, and Practice. These three safety assistants are kin to the much publicized Three E's of Safety and *the most important, from the individual's standpoint, is Attitude*.

It is one's attitude which determines the product of knowledge and practice.

It facilitates the development of good habits and prepares the subconscious to react favorably under given circumstances.

Once the hazards of a particular job are known, we can perform the operation in a safe, efficient way until it becomes second nature to do so.

For instance: to avoid rear-end collisions we must first know that we *can't* stop on a dime and must maintain a safe stopping distance—one car-length per 10 miles of speed behind the car ahead—and that variables such as weather, road, condition of the car, can increase the stopping distance.

We should beware, however, of falling into a trap fashioned by our conditioned reactions.

We must continually re-examine our practices to be sure we are correct.

It is not sufficient to tell a child to cross the street only when the traffic light is green. He should be further instructed to look in all directions, including around corners, to be sure the way is clear.

Since a great number of children have developed an incomplete attitude toward safety, when they grow up to become drivers they still will be convinced they can proceed safely as long as the light is green.

This is one of many adult attitudes that need to be corrected.

And how about the truck driver who, when passing through a town in the wee small hours of the morning, decides no harm is done by running a stop light since no other vehicles are on the streets? Isn't his subconscious likely to trick him into running a red light during a busier time of day?

And what kind of habits do you think a punch press operator is forming when he violates a company rule and removes a safety device because he thinks the particular operation can be performed more easily without the guard and because no one has been hurt doing it that way?

While a person may have the knowledge and practice to do a job properly, he will *not* always use this experience in a safe manner *unless he maintains the proper attitudes*.

Included among these are thoughtfulness toward others, regard for rules and regulations, a willingness to learn from the experience of others as well as your own, above all, being realistic enough to recognize that, no matter how well a task is performed, there is always the possibility of conditions beyond your control causing an accident situation.

Psychologists tell us that, if we have given thought to how we should act if certain events suddenly occur, we are more likely to carry out these actions than if we depend upon instinctive reactions.

By using this principle we can "think out" the emergency action and increase our odds against having an accident.

Our destiny depends on choice, not chance.

Let's pound all the accident prevention attitudes we can into our subconscious.

Revised Construction SO Effective August 8th

Filed on July 9th with the Secretary of State for California, the recently revised Construction Safety Orders became effective on August 8th.

Inquiries regarding printed copies, which are expected to be available in November or December, should be addressed to Documents Section, P. O. Box 1612, Sacramento, California 95807.

Disabling Work Injuries^a by County and Industry Division, California, 1964

Compiled by the Division of Labor Statistics and Research, California Department of Industrial Relations

County	Fatal ^b	Total	Agri- culture	Mineral extraction	Con- struction	Manu- facturing	Trans- portation, communi- cation, utilities ^c	Trade	Finance, insurance, real estate	Service	State and local govern- ment ^c	Industry not reported
Total.....	726	182,173	16,022	2,043	28,209	45,060	15,254	34,034	2,435	17,468	21,599	49
Alameda.....	34	9,346	157	14	1,414	2,728	1,166	1,814	109	808	1,134	2
Alpine.....	—	9	1	1	4	1	—	—	—	—	2	—
Amador.....	2	149	11	3	24	55	4	8	2	9	33	—
Butte.....	12	1,121	239	6	266	182	73	159	6	72	118	—
Calaveras.....	—	158	8	7	30	54	7	6	—	12	34	—
Colusa.....	4	244	129	7	17	14	21	24	2	10	20	—
Contra Costa.....	25	3,628	182	40	814	778	245	835	43	244	447	—
Del Norte.....	12	444	13	1	38	313	19	26	1	10	23	—
El Dorado.....	8	406	22	23	82	90	28	55	2	45	56	—
Fresno.....	26	4,765	1,481	60	393	876	296	847	32	354	423	3
Glenn.....	1	277	117	8	11	48	25	33	1	3	31	—
Humboldt.....	9	2,093	53	3	158	1,358	81	192	5	90	148	5
Imperial.....	9	1,122	467	6	109	88	136	195	2	41	76	2
Inyo.....	2	179	6	32	15	11	37	30	—	22	26	—
Kern.....	28	3,920	1,060	470	346	475	230	695	26	252	366	—
Kings.....	3	794	365	36	68	102	51	92	3	27	50	—
Lake.....	—	195	56	2	20	20	8	42	3	15	29	—
Lassen.....	2	168	7	—	11	89	11	16	1	8	25	—
Los Angeles.....	171	65,639	635	495	8,770	20,215	6,137	13,163	1,116	7,098	7,992	18
Madera.....	1	689	300	12	55	117	46	72	2	27	57	1
Marin.....	4	1,296	57	5	430	131	89	227	17	157	183	—
Mariposa.....	1	112	9	2	38	12	3	6	—	29	13	—
Mendocino.....	9	810	61	6	50	469	34	72	1	29	88	—
Merced.....	10	1,439	516	5	245	183	116	196	3	49	126	—
Modoc.....	1	177	77	2	8	56	5	7	—	6	16	—
Mono.....	—	58	4	5	10	1	4	5	—	20	9	—
Monterey.....	7	2,754	1,010	15	343	371	151	430	16	214	203	1
Napa.....	3	639	76	3	74	137	26	81	4	75	163	—
Nevada.....	4	289	7	13	55	68	25	34	—	39	48	—
Orange.....	22	9,099	438	148	2,198	2,081	451	1,861	151	794	976	1
Placer.....	5	1,076	68	2	495	107	52	120	5	72	155	—
Plumas.....	3	222	12	4	24	116	21	14	—	16	15	—
Riverside.....	21	4,607	868	26	910	744	285	820	35	492	423	4
Sacramento.....	16	4,297	298	6	765	582	297	1,152	56	426	714	1
San Benito.....	2	242	103	40	20	30	10	15	—	10	14	—
San Bernardino.....	26	5,331	520	73	1,020	1,066	372	1,012	41	508	719	—
San Diego.....	25	7,195	424	28	1,383	992	553	1,705	111	1,019	978	2
San Francisco.....	32	9,865	31	1	1,358	1,900	1,541	1,831	312	1,262	1,629	—
San Joaquin.....	11	3,019	701	26	356	731	227	448	19	179	331	1
San Luis Obispo.....	4	800	140	19	113	69	42	180	4	70	163	—
San Mateo.....	17	4,924	107	8	1,082	1,041	508	992	79	542	563	2
Santa Barbara.....	17	2,394	333	104	457	311	154	455	20	335	224	1
Santa Clara.....	16	7,306	344	6	1,496	1,959	447	1,410	96	791	755	2
Santa Cruz.....	1	1,242	182	5	196	367	56	186	10	119	121	—
Shasta.....	8	969	29	1	286	292	71	136	6	55	93	—
Sierra.....	1	104	3	7	21	52	1	2	1	3	14	—
Siskiyou.....	7	604	46	3	43	376	32	51	2	16	35	—
Solano.....	11	1,079	137	18	220	188	94	197	8	70	146	1
Sonoma.....	12	2,202	321	20	315	557	106	285	24	187	387	—
Stanislaus.....	8	2,634	680	7	275	807	161	355	9	155	185	—
Sutter.....	3	558	253	10	42	86	32	67	3	21	44	—
Tehama.....	2	340	91	6	32	91	24	39	1	24	32	—
Trinity.....	2	169	3	—	8	101	8	8	4	9	28	—
Tulare.....	9	2,885	1,373	8	175	413	126	418	5	113	254	—
Tuolumne.....	6	367	3	4	113	128	21	39	2	18	39	—
Ventura.....	10	3,597	930	147	684	419	188	567	21	219	421	1
Yolo.....	5	1,058	314	12	114	184	89	148	3	58	135	1
Yuba.....	1	485	126	14	62	123	19	78	1	15	47	—
Out of State.....	33	574	17	7	47	104	189	80	9	102	19	—
Place not reported.....	2	9	1	1	1	1	3	1	—	—	1	—

^a Disability causing absence from work for a full day or shift beyond the day of the injury.

^b In January 1964, the definition of a "work fatality" for statistical purposes was revised to exclude all fatalities settled by compromise and release, except where the sole issue is dependency.

^c Injuries to employees of publicly operated utilities are included in the transportation, communication, and utilities division.

The Tailgate Safety Meeting . . .

The tailgate safety meeting may be used in both large and small operations.

In small operations, it may be possible to have all employees at the meeting.

In large operations, employees may be split up into groups divided by occupation, or under their specific foremen.

Here are a few points to remember to make "tailgate" safety meetings as effective as they *can* be—as effective as they *actually are* at plants that are getting the maximum use out of them.

1. First of all, hold a meeting at least once a week. Regular meetings will provide the feeling that *they are a regular part of the job, and a valuable one.*

2. Hold the meeting at the beginning of a shift, or right after lunch, or after a break. *Perhaps the best time is at the beginning of a shift,* when everyone is alert.

3. Hold the meeting *right on the job*—preferably where men can sit and smoke.

4. Limit each meeting to between 5 and 10 minutes. If discussion gets hot and heavy—which is good in a way—continue it at the next meeting.

5. Discuss only a *single* point or subject. *This is most important.* And don't choose too broad a subject.

"Hand tool safety," for instance, is much too comprehensive a topic to be covered even briefly at a short meeting.

But "defective hand tools," or "returning hand tools to proper place," or "cold chisel use" might be good and appropriate subjects.

6. *Do* spend some time and thought *before* the meeting, so that you are ready to stimulate discussion if necessary.

7. While you yourself may open the meeting by stating the subject and presenting the hazard or problem, *try to get the group to develop the discussion* and to sum up the solution that will provide safety.

8. Use positive approaches and conclusions whenever possible.

("We can bring our housekeeping up to a high standard. You men can develop habits of neatness and cleanliness." *Not* "The housekeeping around here is terrible. You men are too sloppy.")

Appropriate Topics

There are any number of topics that can be covered at tailgate meetings, but *your own group's activities should furnish the source of all, or almost all, your topics.*

1. You can review an unsafe act or procedure that you have observed among your own men, to introduce the topic of safe practices or safe procedures.

However, *don't mention names or blame anyone* at a tailgate meeting. That is not the time or place for it, and might only stifle discussion.

2. Discuss a recent injury or accident either at your own operations, or one you have learned about from an outside source such as a newspaper, trade journal or neighboring plant.

3. Discuss how a piece of new equipment can be safely operated.

4. Review a good safe job recently completed by your own group or in your own organization.

5. Review an unsafe condition that was not promptly corrected—a guard removed, an obstructed walkway, a defective tool not reported, repaired, or replaced—with emphasis on the injury that *could* have resulted from it.

Let the Men Talk

You can either lead the group yourself or have one of your men act as the leader.

In the latter case, discuss the subject with him beforehand if possible, and give him pointers on conducting the meeting.

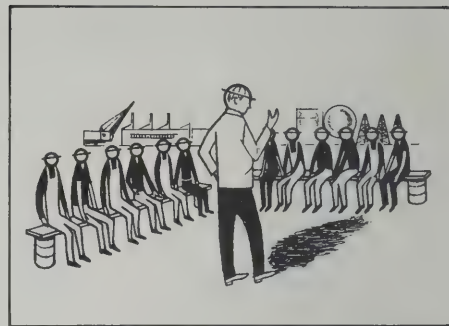
At some meetings the leader may just state the safety problem and throw it open for discussion.

At others, he may do all or almost all the talking.

It depends on what is being discussed.

Where possible, however, it is good if the men themselves are encouraged to speak, and to offer recommenda-

(a reprint of one of our most popular brochures, Bulletin 154)



tions or solutions. If they do, they will take much more interest in seeing that the recommendations or solutions are carried out.

Records and Reports?

As a rule, it is *not* advisable to take notes or keep any long records or minutes of tailgate meetings. It would *limit* participation by others.

Of course you can make a note *later* (for your own ready reference) that you discussed such a subject on such a day, and what was forthcoming from the discussion.

Some Topics

The following are outlines of some topics of general interest, to help you get started.

You will be able to think of many others of particular value in your own operations.

Topic No. 1—Safeguard Off

a. Guards are placed on machines to prevent a person from contacting moving parts.

b. Scores of California workers are injured or killed each year because guards are left off machines.

c. *Why are guards left off machines?* Let the group give reasons for this.

Some reasons often given:

(1) No time to replace it.

(2) The boss said, "Let's go."

(3) Wanted to be sure the machine operated properly before installing the guard, but it was left off indefinitely.

(4) Guard did not fit a new drive.

(5) Had to remove guard to adjust or lubricate.

(6) "Could not do the work with the guard on," or "it slowed me down."

(7) "Ran these machines without a guard for years, and never got hurt."

d. Each of the above alibis and others have been stated hundreds of times following serious injuries. *After* the accident, positive corrections are taken; attitudes are changed; safety measures are revised.

But that should be done *before-hand*; and *that* is the purpose of your meeting.

Topic No. 2—Portable Electric Drills

a. An important tool that many of us use in our work.

b. A safe tool *if* properly maintained and used.

c. Review injuries or accidents within the group's experience.

d. Hazards. (Discussion can develop these.)

(1) Revolving drill.

(2) The frame becomes energized—causing fatal electric shock or fall from height.

(3) Flying chips or broken drill fragments.

e. By discussion, develop safe practices that will correct above hazards.

f. Sum up your safety measures regarding portable electric drills.

Topic No. 3—Defective Hand Tools

a. Mushroom heads, split handles, loose handles, dull or broken teeth, spread wrenches—these are some defects you can point out.

b. Review injuries your group has had that were due to defective hand tools.

c. Bring some defective tools (if any) found on your own operations, and discuss them at the meeting.

d. By discussion, set up a program of *reporting* and *repairing or replacing* defective hand tools at your operation.

Note: Misuse of hand tools will probably be mentioned, but do not let it confuse the thinking on defective hand tools. "*Misuse of Hand Tools*" can be a topic for a *separate* meeting.

Topic No. 4—That Fraction of a Minute

a. It takes only two to ten seconds to climb out of the seat of a truck, "cat," or shovel to the ground.

b. Drivers or operators of trucks, "cats," or tractors sustain more injuries in that "fraction of a minute"

operation than in any other single phase of their work.

c. They slip; they fall; they step on blocks, rocks, curbs, tools, or into holes.

d. They do not look—they do not think.

e. *Why?*

1. Are they too fast?

2. Are they thinking of something else to the exclusion of their "getting out" safely?

3. Develop other answers by the group to "*Why?*"

f. You are holding a meeting of a group of men who are trained, experienced, and safety conscious in respect to their job. They have discussed the *why* of these "fraction of a minute" accidents. Now try to get them to determine *how* to create a positive desire to break hazardous habits regarding this simple and repetitive operation.

g. Any one of these men could climb out of his truck safely if he could be motivated to *think* of his safety when doing it.

Topic No. 5—Planned Jobs

a. A planned job is one where each operation is put in its proper place, and arrangements are made *before-hand* for manpower, tools, and equipment to be available as necessary. *Safety is planned right in with the job.*

b. As your regular operations should be organized for efficiency and safety they are not usually thought of as planned jobs. However, any change in operation, any non-routine maintenance, or any unusual jobs should be planned jobs.

c. One large utility company has electric crews and gas crews who go out on installation and maintenance jobs. A crew may complete several jobs in one day, or take several days to complete one job. All crews hold a "tailgate" meeting every morning, and also immediately *before* starting a new job.

d. Your tailgate safety meetings may be devoted to planning a job. (In a properly planned job, safety will of course be included.)

e. Many accidents, some causing personal injury and some not, would be prevented by proper job planning

with the group that is going to do the job.

f. In this meeting, evaluate the jobs of your operation that could be properly planned, or devote the entire meeting to a planned job that the group is going to do in the near future.

Topic No. 6—Goggles

a. Eye injuries make up 4.6 percent of all work injuries in California. In the Mineral Extraction Industries, the rate is higher, 4.9 percent. In other words, one out of every 22 injuries in this State is to the eyes.

b. The above figures would *undoubtedly* be much higher if goggles were not *generally* worn.

c. Let's discuss that word *generally*. As we are using the word it means *usually*, but not *always*.

d. Let the group list operations where goggles should be worn, and the type of goggles necessary to protect the eyes from welding rays, flying particles, dust, hot metals, corrosive liquids.

e. Discuss a procurement, distribution, and maintenance program.

f. By discussion, find out if there is any resistance on the part of the group, or any individual in the group, to the program. If there is, find out *why*.

g. Remind the group, if necessary, that goggles can be comfortably worn on any job *if they are of a suitable type*. There are operations in the Mineral Extraction Industries where the wearing of goggles during working hours is mandatory, even for visitors.

Value Proved

Whenever tailgate safety meetings have been properly and conscientiously conducted, they have proved their worth.

As a result, the tailgate meeting is being more and more popular, and is recognized as an essential *part* of many operations.

We can sum up its value in the words of one foreman in a Mineral Extraction industry, after he had tried it out for a few months.

"These tailgate meetings are making my crew work safe; now they won't let one another follow an unsafe practice or procedure around the job."

END.

Recent Convictions for Violations of Safety Orders

Colich Construction Company, of 8320 Isis Avenue, Los Angeles, pleading *nolo contendere*,* was fined \$500 for the violation on February 23rd of Labor Code Section 6402, which states, "No employer shall require, or permit any employee to go or be in any employment or place of employment which is not safe."

In this particular case, *one worker was killed in a cave-in of an unshored manhole roughly 12 feet deep.*

Judge Richard Schauer of Municipal Court, Division 20, Los Angeles, rendered the verdict on June 22nd.

Deputy City Attorney Bennett I. Kerns prosecuted.

Leonard E. Lake, a subcontractor, of 730 Shasta Street, West Covina, pleading *nolo contendere*,* was fined \$500 plus \$50 court costs for the violation on April 13th of Penal Code Section 385(b), which makes it a misdemeanor to bring any equipment within six feet of high voltage lines.

In this instance, Lake was operating a mobile crane which contacted the power line while a foreman and two workers were placing a cable on a storm drain pipe.

The foreman was electrocuted, the others escaping with burns.

Judge Fred W. Raab of the Municipal Court of Citrus Judicial District, West Covina, rendered the verdict on May 6th.

Deputy District Attorney Maurice H. Oppenheim prosecuted.

Wasco Concrete Pipe Company, of Central Valley Highway and Poso Drive, Wasco, pleaded guilty to allowing an employee to work in an excavation 12 feet deep (in a river bank) that was not shored or sloped.

The worker, W. D. Moten, suffered a fatal injury when the excavation caved in on March 3rd.

On June 7th, Judge Doyle Miller of Municipal Court, Bakersfield, fined the company \$276 for the violation.

District Attorney Kit L. Nelson prosecuted.

A. T. Acrey, doing business as Regent Pipe and Construction Co., also known as Regent Construction Co., 2412 Renegade Avenue, Bakersfield, pleaded guilty on May 26th to a failure on March 1st to provide workers with protection against the hazards of moving earth.

Raymond Fowler, Ventura County's Safety and Claims Officer, signed the Complaint.

Judge Marvin H. Lewis of Oxnard-Port Hueneme Judicial District, Oxnard, imposed a \$100 fine.

Assistant District Attorney A. S. Bertelsen prosecuted.

H. R. H. California, Inc., of 7301 Artesia, Buena Park, pleaded *nolo contendere*,* on July 6th on the charge of failing to provide a safe place of employment.

The failure resulted on March 5th in the death of a worker who, unequipped with a safety belt, fell from an overhead beam and was killed.

Judge Claude M. Owens of the Municipal Court, Anaheim-Fullerton Judicial District, rendered the verdict on July 6th.

Deputy District Attorney Lloyd M. Larsen prosecuted.

Two Santa Monica builders, **Harold D. Higgins**, of 1526 Bay Street, and **John Trussell**, of 1801 Dewey Street, both pleaded *nolo contendere*,* on June 1st to a violation of Labor Code Section 6400, which requires every employer "to furnish employment and a place of employment which are safe for the employees therein."

The violation resulted in the death of a carpenter, Robert Pointer, who was working on a penthouse roof of a building under construction with a high voltage line only about three feet away. While working with a power hand saw, Pointer raised his head and touched the line.

Judge W. Blair Gibbens of Santa Monica Municipal Court fined the defendants \$125 each, imposed a 30-day jail sentence (suspended), and placed

them on summary probation for two years.

Deputy City Attorney M. L. Barth prosecuted.

William H. Jones, doing business as Jones Sewer Company, 6960 Murietta Street, Van Nuys, was sentenced to a 30-day jail sentence (suspended), and placed on two years summary probation, for failure to provide shoring in an excavation on June 10th.

The failure resulted in a cave-in that buried a worker in earth for more than two hours.

(Fortunately for the worker, his hard hat fell in front of his face, preventing immediate suffocation, and a special fireman's rig equipped with an air tank was able to supply him with air through a pipe until he was freed.)

Judge Harvey Pregerson rendered the verdict on August 20th in Los Angeles Municipal Court, Division 67.

Deputy City Attorney Kim H. Pearman prosecuted.

Your excellent publication, CALIFORNIA SAFETY NEWS . . . and your bulletins, are read with great interest in the Safety Office and then routed around the institution for the information of everyone.

—U.S. Dept. of Justice
Federal Correctional Institution,
Danbury, Conn.

Next GISC—Feb. 3rd & 4th

The next annual two-day meeting of the Governor's Industrial Safety Conference will be held at the Fairmont Hotel, San Francisco, on February 3rd and 4th.

The meeting will wind up with a luncheon on the second day.

Full particulars will appear in the December CSN.

Meanwhile, those planning to attend and wishing to stay at the Fairmont might care to book reservations with that hotel now.

* "a plea by the defendant in a criminal prosecution that without admitting guilt subjects him to a judgment of conviction as in case of a plea of guilty but does not preclude him from denying the truth of the charges in a collateral proceeding."—Webster

Yours for the Asking

To those interested in accident prevention in industry, a number of publications of the DIVISION OF INDUSTRIAL SAFETY will be of value.

They are yours for the asking—free!

For obvious reasons, we do not send more than three complimentary copies of any brochure to anyone outside the State.

Bulletin 103, "Safe Handling of LP-Gas," gives the use and characteristics of LP-Gas, and the rules and standards that govern safe handling.

Bulletin 104 (Rev.), "Ground It!" explains the necessity and wisdom of grounding electrical hand tools.

Bulletin 106, "Ladders on the Farm," gives ladder pointers which, if followed, will reduce the high rate of disabling injuries caused by poor farm ladders and improper use of sound ladders.

Bulletin 107, "The Ship-Shape Shop," shows how good housekeeping and maintenance will save lives, limbs, and money.

Bulletin 108 (Rev.), "Taming the Circular Saw," deals with a most useful but dangerous wood-working tool.

Bulletin 110, "Tips for Hotel Workers," shows that hotel worker accidents are easily prevented if a few simple tips are followed.

Bulletin 111, "Farm Safety Check List," is a safety guide for everyone on the farm.

Bulletin 117, "Stop Grinding Out Injuries!" is about the abrasive wheel, and gives pointers which, if observed, will eliminate almost all grinding wheel injuries—of which over half are eye injuries.

Bulletin 120 (Rev.), "Safety Rules for Painters," tells you the four things that cause four out of five injuries to painters, and shows you how to prevent such injuries.

Bulletin 121 (Rev.), "Ladder Safety—Step by Step," shows that there is no bad luck about ladders when you observe three common-sense precautions.

Bulletin 122, "Handy Rules for Hand Tools," describes the proper care and use of such tools as files, screwdrivers, wrenches, chisels, hammers, knives, and handsaws.

Bulletin 124 (Rev.), "Safety Rules for Roofers," analyzes roofer injuries in a 12-month period and tells how to prevent them.

Bulletin 125 (Rev.), "Are You Using Carbon Tet?" deals with a chemical that has caused work injuries and deaths.

Bulletin 127, "Look Out for Yourself If You Are Around Crop Spraying," an illustrated booklet directed to the farm worker himself, explains how pesticides can be used safely. (*Available in Spanish also.*)

Bulletin 128, "If You Work in a Quarry," is for the quarry and open pit mine worker, and points out the things he should keep in mind.

Bulletin 133, "Analysis of California Logging and Sawmill Fatalities," contains a study of logging and sawmill deaths in California, and an injury-prevention program.

Bulletin 135 (Rev.), "Check List of Requirements," a guide for employers, safety engineers, and purchasing agents, shows what they should check for before buying or renting equipment or placing contracts.

Bulletin 137, "Skin Trouble Is Plenty Trouble," deals with the most common disease you can get at work.

Bulletin 138, "Supervision and Explosives Accidents," analyzes explosives injuries in California in a three-year period.

Bulletin 140, "Keep AWAY From Power Lines!" is for any and all workers whose jobs may expose them to the hazards of overhead electric power lines.

Bulletin 141 (Rev.), "Power Hand Saw Safety," gives common causes of power hand saw injuries, and tells how to stop them.

Bulletin 142, "Read and Understand the Label!" reminds us how vitally important it is to read and understand the labels of containers of hazardous chemical and mixtures.

Bulletin 143, "Trade Association Safety Programs," shows the value of such programs and what they can do for you.

Bulletin 144, "The Know-How of Wire Rope Safety," gives information that the man on the job and his boss should know.

Bulletin 150, "Electrical Safety and Swimming Pools," describes precautions that would make swimming pools safe electrically.

Bulletin 151, "Control of Noise in Industry," emphasizes the need for either eliminating or controlling excessive noise, and gives practical methods for doing so.

Bulletin 153, "Electrical Safety on the Farm," points out the many electrical hazards encountered on the farm, and tells how to guard against them.

Bulletin 154, "The Tailgate Safety Meeting," gives pointers on an effective means of promoting on-the-job safety.

Bulletin 155, "Pesticide Regulations," tells how to guard against hazards in the use of poisonous and toxic pesticides containing organic phosphates.

Guard Standards, No. 1, Materials and Construction, gives invaluable advice on constructing guards and selecting the right materials for them.

Guard Standards, No. 2, Stairways and Railings, gives requirements for stairways, railings, entrances to stairways, and floor and wall openings.

Form 634, an 8½" x 11" placard. Safety Responsibilities—Employer and Employee— prescribed in Labor Code. (*Available in Spanish also.*)

Available Reprints include

Power Press Safety

Transportation of Workers — Current California Regulations

Lifting With Safety (Limit within California: 100 copies for any organization, one copy for any individual)

Several construction bulletins, omitted from this list, are being amended in the light of the recently revised Construction Safety Orders.

Safety Orders Available at Documents Section

The following Safety Orders are available from Documents Section, P.O. Box 1612, Sacramento, California 95807.

Where Safety Orders have been revised (as almost all of them have been), the date is the date of the latest revision.

	With sales	
	Price	tax
Aerial Passenger Tramway Safety Orders (1956).....	\$0.50	\$0.52
Boiler and Fired Pressure Vessel Safety Orders (1955).....	.50	.52
Compressed Air Safety Orders (1946).....	.50	.52
Construction Safety Orders (1965).....		
Electrical Safety Orders (1962).....	1.50	1.56
Elevator Safety Orders (1954).....	1.00	1.04
General Industry Safety Orders (1963).....	1.00	1.04
Logging and Sawmill Safety Orders (1958).....	1.00	1.04
Mine Safety Orders (1958).....	.75	.78
Petroleum Safety Orders—Drilling and Production (1959).....	1.00	1.04
Petroleum Safety Orders—Refining, Transportation and Handling (1951).....	.75	.78
Pneumatic Explosives Loading Safety Orders (1944), Quarry and		
Open Pit Mine Safety Orders (1953).....	.75	.78
Ship and Boat Building Safety Orders (1961).....	.50	.52
Tunnel Safety Orders (1962).....	.75	.78
Unfired Pressure Vessel Safety Orders (1964).....	.75	.78
Window Cleaning Safety Orders (1952).....	.50	.52

From
DEPARTMENT OF INDUSTRIAL RELATIONS
DIVISION OF INDUSTRIAL SAFETY
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Diver entering the "back porch" of an underwater dwelling



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Vol. 49, No. 2
June 1965

California Safety News

California Safety News

Vol. 49, No. 2, June 1965

The California Safety News is mailed free of charge to those interested in industrial safety

California's Concern for Workers...

The DEPARTMENT OF INDUSTRIAL RELATIONS is concerned with virtually every aspect of the welfare of the worker.

One of its important responsibilities, fulfilled through the DIVISION OF INDUSTRIAL SAFETY, is to see that there is "full provision for securing safety in places of employment," as the State Constitution requires.

As I have often stated, *preventing on-the-job injuries is a major aim in California*, and the DEPARTMENT leaves nothing undone in the unending campaign to make our workplaces ever safer.

But despite all efforts, work injuries continue to happen, often of a most serious nature. *In such cases, every endeavor should be made to fully rehabilitate the worker; and where this is impossible, to make sure that he and his family are at least spared the burden of financial worry.*

A recent case illustrates California's profound solicitude for all who work within its borders.

As a result of a fall from a ladder while picking apples in a California orchard, a Mexican National became a quadriplegic at the age of 41. The STATE COMPENSATION INSURANCE FUND (another agency within the DEPARTMENT) provided him with extensive medical treatment, and then, after an on-the-spot check of rehabilitation facilities in Mexico, returned him to his native land.

The trip, made by air, required two complicated transfers en route, but careful preplanning and the attendance of a FUND adviser made the trip a smooth and comfortable one.

In Guadalajara, the patient was reunited with his wife, who was given training in caring for his disability, after which he was transferred to his home town.

His morale as well as his physical health are buttressed by continuing contact with Mexican doctors who communicate regularly with the FUND, and by the knowledge that compensation benefits will provide living expenses for his family during his lifetime.



Ernest B. Webb

In This Issue...

Resuscitated by tremendous demand and soaring prices, *"Quick" Comes to Life Again!* Page 8.

As the ocean is expected to supply more and more of our needs in the foreseeable future, we might do well to look at *Man and the Aquatic Environment*. Page 10.

A far from happy combination is made by *Alcoholic Beverages and Industrial Safety*. Page 6.

All that makes for safer working conditions is desirable, but *There Is No Substitute for Safety Surveys*. Page 3.

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There Is No Substitute for Safety Surveys . . .

by GEO. A. SHERMAN, Chief of the DIVISION OF INDUSTRIAL SAFETY

A safety engineer of the DIVISION OF INDUSTRIAL SAFETY was compelled to order the closing of a supermarket freezer room because it did not have at least one door that could be opened from the inside, as Safety Orders require.

The owner then complied with regulations.

A few months later an armed bandit herded five employees into the freezer after closing time, and fled.

Thanks to enforcement of the safety regulations, the employees walked out alive.

A DIVISION safety engineer took formal action against a machine shop owner for not having the required guarding on a compressor operation.

The owner then complied.

Not long after, a worker was standing directly in front of the machine when the flywheel pulleys of two compressors snapped off.

He was saved from certain injury or death only because the heavy, fast-spinning pulleys failed to penetrate the protective guard that had been required.

A DIVISION safety engineer required an explosives manufacturing plant to see that its employees wore flame-retardant coveralls.

A few days later, compliance with the Safety Order paid a handsome dividend when a power punch pellet press exploded, to ignite two cans of black powder.

The maintenance man present at the time suffered minor burns when the sleeve ends and collar of his shirt caught on fire. However, his flame-retardant coveralls prevented him from becoming a living torch, and saved his life.

A DIVISION safety engineer discovered a workman in a ten-foot hole that was without shoring of any kind.

In the absence of the foreman, our engineer instructed the workman to come out of the hole and remain out of it until shoring was installed.

A few minutes later, one side of the hole caved in—just where the man had been working.

These are just a few of many dramatic cases where compliance with requirements written by DIVISION safety engineers are *known* to have saved life and limb.

For *each* such case, there are many thousands of others in which injury and death were averted by compliance with requirements, but of which there is no actual record—except *indirectly*, in the decline of California's work injury rate during the last fifteen years.

These requirements are written by DIVISION safety engineers in their normal, everyday safety surveys of places of employment.

They *also* prove, though not as spectacularly as the specific cases already cited, that *there is no substitute for safety surveys by DIVISION safety engineers.*

The following are some of the literally *millions* of unsafe conditions discovered over the years by field personnel of the DIVISION OF INDUSTRIAL SAFETY during their day-to-day injury prevention surveys of workplaces.

What is much more important, those conditions were *corrected*, to make work *safer*.

In many cases a potential disaster was averted.

An employee was using LP-Gas vapor to clean a tank. The discharge of such large quantities of LP-Gas into the atmosphere at the location was extremely hazardous, and, if a DIVISION safety engineer had not summarily stopped the proceedings, could have caused a fatal accident—as *indeed had happened at that very place a few months previously.*

Finding an air tank improperly constructed for the pressure used, a DIVISION safety engineer immediately ordered it out of service.

As the tank was in use at a tunnel project, its failure could have been especially serious in terms of injury and death.

Miners in a quicksilver mine were found working in an explosive mixture of gas, only a short distance away from a ventilation fan with an open-type motor located in the return air. Had the mixture been allowed to accumulate to the point where



it would have reached the motor, an explosion might have occurred, to injure or kill the workmen.

The DIVISION safety engineer directed the mine superintendent to immediately remove the men from the area, to remove the electric fan to the fresh air, and then follow a specific procedure to safely remove the gas from the mine.

An octave band analysis of noise generated by a vibration machine showed that many workers were being exposed to a noise level of about 113 decibels, some sixty times above the safe level of exposure (as based upon five-hours of exposure in the work day).

The DIVISION safety engineer discussed several possible controls with management, which adopted a satisfactory engineering method to eliminate the hazard.

Survey of a rubber appliance manufacturing plant revealed that women workers were being subjected to the hazard of toxic fumes.

The DIVISION safety engineer not only required a correction of the unsafe condition, but helped management design a simple, inexpensive means of satisfactory mechanical ventilation.

The DIVISION performs many valuable services to the people of California. Some of these services are listed below.

It prepares Safety Orders (standards of work safety) which, if adopted by the Industrial Safety Board, have the force and effect of law.

It enforces laws and lawful orders requiring work and workplaces to be safe.

It investigates many work injuries and deaths.

It examines, tests, and approves (or disapproves) certain types of

equipment, if only approved equipment is allowable under the Orders.

It helps management and labor organize safety programs.

It reviews (if asked) plans and specifications of new facilities to check whether they conform to requirements—thus helping to avoid possibly expensive alterations later.

It publishes brochures on injury prevention, and the CALIFORNIA SAFETY NEWS, an injury-prevention quarterly. The brochures and the CSN concentrate upon on-the-job hazards and means of eliminating or controlling them.

It maintains an industrial safety library that is the finest source of information of its kind in California.

It takes active part in various conferences, notably the Governor's Industrial Safety Conference.

All the above activities play a part in the DIVISION's program.

But none is more important than the safety surveys conducted by the DIVISION's safety engineers.

For it is *during* these routine surveys, conducted day after day in an unsung but most valuable fashion, that many accomplishments are achieved.

It is *then* that the DIVISION not only fulfills its enforcement functions, but can inform management *why* the specific regulations must be observed, and *how* they can most simply be complied with.

The surveys have contributed to the significant reduction in work injury rates in California since 1950. In addition, they have resulted in developing general safety attitudes that have benefited not only employers and employees, but society in general.

Disabling Work Injuries Averted in California Since 1950 By Lower Injury Rates

Year	Injuries Averted
1951	2,400
1952	10,100
1953	20,700
1954	31,500
1955	27,900
1956	30,900
1957	43,600
1958	47,500
1959	39,500
1960	49,800
1961	50,600
1962	55,900
1963	56,300

Total 466,700

Credit for the number of injuries averted belongs to management, labor and government, all of whom played a part in the better injury picture.

Figures compiled by
Division of Labor Statistics and Research

Hard Hats—Chilling Demonstration of Their Value!

One of the most dramatic proofs of the value of wearing hard hats, especially on construction jobs, was demonstrated recently in San Francisco.

We quote from the May 20th issue of the *San Francisco Chronicle*, whose account and pictures we reproduce with permission.

A chilling demonstration of why construction workers wear "hard hats" occurred in the heart of the Financial District yesterday.

Far below the bare steel tower of the still-rising Wells Fargo skyscraper at Montgomery and Sutter streets, two workmen paused briefly on its Montgomery street side.

An instant later a heavy length of timber fell from the 20th floor and hit them.

"We went down like poled steers," said Roy Armstrong, of 16044 Vecinos, San Lorenzo, a 61-year-old foreman. "But we were lucky.

"It split Bob's hard hat wide open."

"Bob" is Robert Prigley, elevator constructor of 1482 Fifth Avenue.



One of the damaged helmets

The hunk of timber, about four feet long and four inches thick, "got my shoulder and Bob's head," Armstrong said.

Armstrong suffered a possible fracture of the left shoulder and Prigley possible injuries to the head.

But they are *alive*—thanks to the hard hat.



Path of the falling timber

Recent Convictions for Violation of Safety Orders

Peter Kiewit Sons' Co. (whose main California office is in Burlingame, California) was fined \$276 for the violation on November 16, 1964, of Section 385(b) of the Penal Code, which makes it a misdemeanor to bring any equipment within 6 feet of high voltage lines.

In this case, the crane boom touched the overhead line to a gravel screening plant at Turner Dam, resulting in the electrocution of Chris Higuera, a worker who was removing slings from hooks at the rear of the crane.

Judge William H. Gale, of Pleasanton Judicial Township rendered the verdict in Pleasanton on February 23, 1965. The firm pleaded *nolo contendere*.*

Assistant District Attorney Harold I. Moore prosecuted.

Crane operator Jesse G. Burns, who also pleaded *nolo contendere*,* was fined \$83.

Bosko Construction Corporation, of 8520 Fishman Road, Pico Rivera, was fined \$25 plus court costs, for failing to provide safeguards, maintaining an unsafe place of employment, and permitting an employee to be in an unsafe place of employment.

In this case, which involved failure to guard the V-belt and sheaves on the water pump and fan of a backhoe, an oiler caught his fingers in a sheave and lost portions of three fingers.

Judge John J. Merrick of the Justice Court of Malibu Judicial District rendered the verdict on March 15, 1965.

Deputy District Attorney Herman Herzbrun prosecuted.

William L. Hobman, doing business as Hobman Construction, Inc., and **Robert C. Neubas**, foreman, were each fined \$100 for an incident in which the foreman ordered an apprentice to use a powder actuated tool in an unsafe way.

The apprentice fired the tool into a steel pipe that was part of a building

structure. The stud ricocheted and passed through his body.

Both defendants pleaded *nolo contendere** to violations of Labor Code sections relating to on-the-job safety.

Judge Howard E. Crandall rendered the verdict on March 22, 1965, in Los Angeles Judicial District, West Los Angeles.

Deputy Attorney Harry C. Anderson prosecuted.

Conant & Lieberman, of 5951 Venice Boulevard, Los Angeles, was fined \$600 for permitting employees to work on October 13, 1964, in a deep unshored trench.

The very previous day, on the same project, a worker had been killed in a cave-in.

George Turney, superintendent of the company, was fined \$100 or ten days in jail on each of two counts.

Both defendants pleaded *nolo contendere** to the charge.

Judge Richard Schauer of Municipal Court, Division 20, Los Angeles, rendered the verdict on March 23, 1965.

City Attorney Paul Gilbert prosecuted.

Daniel Estrada, doing business as Daniel Estrada Co., sewer contractors, was fined \$150 and put on summary probation for two years for violating Labor Code Section 6402, which bans an employer from requiring or permitting "any employee to go or be in an employment or place of employment which is not safe."

In this case, the unsafe place of employment was a trench that was not adequately shored or sloped.

Judge Celia Baker of Huntington Beach Municipal Court, Division I, rendered the verdict on April 26, 1965.

Deputy District Attorney Alan McKone prosecuted.

* "a plea by the defendant in a criminal prosecution that without admitting guilt subjects him to a judgment of conviction as in case of a plea of guilty but does not preclude him from denying the truth of the charges in a collateral proceeding."—Webster

Notable Safety Record

The Standard Register Company's plant at 2101 Livingston Street, Oakland, is compiling a splendid and (at the time of going to press) still continuing safety record.

As of June 24th, the plant has gone 3,700,000 manhours without a disabling injury. It has had no injury since December 1959—five and one-half years ago.

Congratulations!

Letters to the Editor...

I am continually impressed with the material presented in your CALIFORNIA SAFETY NEWS.

—Keith P. Harris, Safety Coordinator
Iowa State Highway Commission

We have derived much benefit from your wonderful magazine CALIFORNIA SAFETY NEWS.

—Nathan G. Baker, Chief, Division of Safety
National Park Service, U.S. Dept. of the Interior

We are thankful for you sending the CALIFORNIA SAFETY NEWS. Over the past few years we have used a number of the ideas presented in the NEWS, and we agree heartily with your accident prevention philosophy.

—Samuel T. Logan, Chief, Safety Office
U.S. Army Engineer Division, Lower Mississippi Valley

The safety rules in these publications—[various DIVISION OF INDUSTRIAL SAFETY brochures]—are dramatically presented, and the Safety Engineering Department of the Company makes use of these articles in an assist to our insureds in their safety programs.

—Evan R. Webb, Engineering Department
The Hartford Insurance Group

We find it—[the CALIFORNIA SAFETY NEWS]—very useful in our industrial safety program.

—A. W. Dorow, Plant Manager
Libby, McNeill & Libby, Kent, Washington

Following reading of your March 1965 issue of CALIFORNIA SAFETY NEWS . . . I would appreciate being placed on your mailing list. I find it to be an excellent source of current information pertaining to the safety profession.

—W. E. Scanlon, Safety Engineer
Wright-Schuchart-Harbor, Arcata

Our organization has been exposed to your publication CALIFORNIA SAFETY NEWS and finds the material of great interest. We request that you place our name on your mailing list.

—Richard H. Good, Financial Secretary
Int'l Union of Operating Engineers, Local 139

Henry J. Franey Passes

It is with deep regret that we record the passing of Henry J. (Jim) Franey, who succumbed to a heart attack on June 23rd at the age of 57.

With a wide background in construction and mining, Franey joined the DIVISION OF INDUSTRIAL SAFETY in 1957 as a safety engineer.

For the last four years he served as a district engineer in the Pressure Vessel Section.

Franey was a member of the American Institute of Mining, Metallurgical and Petroleum Engineers.

Alcoholic Beverages and Industrial Safety...

By NICHOLAS J. KHOURY, M.D.

The use of alcoholic beverages by those who work presents problems not only to management and labor, but to the American public as a whole.

The enormous financial costs of these problems have resulted in the coining of the apt phrase, *industry's billion dollar hangover*.

That hangover includes physical injury, reduced production, impaired workmanship, faulty products, and increased medical and workmen's compensation insurance costs.

Then of course there is the untold *suffering* that occurs as a result of injuries from accidents caused, in whole or part, by individuals who have been drinking.

I shall not confine myself to problems relating to the employee who drinks, but shall speak broadly about *all* individuals, *employers* as well as *employees*, who use alcoholic beverages during the normal hours of work productivity. I shall also discuss the *effects* of such drinking.

Alcohol *depresses* the central nervous system—the part of the nervous system which supervises and coordinates the activity of the entire nervous system; and any *apparent* stimulation sensed after drinking is due to the release of the inhibitory higher levels of the brain, rather than to the alcohol itself.

With respect to motor vehicle accidents, it has been shown repeatedly that *alcohol is involved in about 50% of all fatal accidents*.

In Montana during a test period, 48% of drivers killed in auto accidents were considered legally drunk.

In Westchester County, New York, over an eight year period, 49% of drivers in fatal accidents were drunk, and another 24% were found either just under the legal minimum blood alcohol level or suffering from a hangover.



A Cornell University Study showed that 73% of accident-responsible drivers had been drinking, and that 46% of this group had blood alcohol levels of 0.25% or higher.

(In many states an individual is legally considered to be under the influence of alcohol if his blood alcohol level is 0.15% or higher.)

One research group reported that if a person's blood alcohol level is .05% to .10%, his chances of having an accident are 1½ times as great as those of a non-drinker.

At blood alcohol levels of .10% to .15%, they are 2½ times as great.

At levels of .15% and higher, the chances are some ten times as great.

It is now generally accepted that alcohol is involved in about 50% of all fatal motor vehicle accidents.

Some Effects of Alcohol

We can readily accept the accuracy of the various studies mentioned if we consider a few facts about the effects of alcohol on an individual.

One ounce of 86 proof liquor raises the blood alcohol level of an average 150–160 pound individual about 0.015%.

One ounce of 100 proof liquor raises the blood alcohol level almost 0.02%.

One bottle (12 ozs.) of 3.2% beer produces almost the same effect as one ounce of 86% proof liquor.

The body can metabolize approximately three-fourths of an ounce of 86 proof liquor in an hour.

The rate of absorption from the stomach or small bowel depends on the concentration and emptying time of the stomach. Alcohol is absorbed more rapidly from the intestines than from the stomach, and the optimum concentration for maximum absorption is about 17 to 20% alcohol.

An individual's ability to drive and react can be impaired at blood alcohol levels as low as 0.035%, *or after two beers or drinks taken in a short period.*

Regardless of one's tolerance to alcohol, almost every driver's ability is affected at a blood alcohol level of 0.05%—a couple of generous drinks.

Alcohol is related to the ether compounds. It is a sedative, a tranquilizer; and as such, it can impair not only one's ability to *react* to a situation, but one's *judgment* in making decisions.

What must also be remembered is that *these reactions from the use of excessive alcohol often continue during the hangover period.*

While everyone may agree that alcohol and gasoline do not mix well, *very few are aware of the dangers involved when an individual drinks alcohol-containing beverages after he has taken some pill or other internal medication.*

I refer not only to pills or other medications obtained on a doctor's prescription, but to the many so-called proprietary remedies that are available over almost any grocery store or drug store counter.

These so-called proprietary remedies may be described as something to make you sleep, or something to calm your nerves, or something to keep you awake and give you energy; but although they are certified as safe for human consumption if the directions are followed, they should also carry a huge warning on them saying: *"Do not combine with alcoholic beverages."*

A variety of famous cold remedies that contain antihistamines also constitute a source of extreme danger if they are followed by a few drinks.

The synergistic effect of alcohol with other medications is not predictable in each instance, or with respect to each individual. But as it constitutes a potential source of danger, no individual who takes an alcohol-containing beverage on top of an internal medication should attempt to operate a motor vehicle or perform any tasks involving heavy equipment.

Although almost every company prohibits the use of alcoholic beverages during working hours, it is an extremely common practice for both lower and higher echelon supervisors to look the other way and fail to enforce the ban.

It is not uncommon for employers and employees to have either a couple of cocktails or a beer or two with their lunch, and then return to work with the impression that the drinks will not affect their efficiency in any way at all.

However, while there *may* be exceptions, *it is almost invariably true that any individual who takes a couple of martinis or beers with his lunch will feel sluggish and slow down perceptibly as the afternoon progresses, with his efficiency and productivity definitely impaired.*

If an error or accident then occurs, it is usually *not* attributed to alcohol if the individual concerned is not an alcoholic. The fact that he had taken one or two drinks at lunch time is seldom considered either the sole cause or a contributory cause of the accident or error, although it often undoubtedly *is*.

Social Drinkers

I have refrained from discussing the problem of alcoholism and the chronic alcoholic in industry, because that problem is plain enough and has received widespread publicity and recognition.

What generally has not been recognized is the fact that *it is not only the alcoholic who can get into trouble by drinking during his working day, but the so-called social drinker or non-alcoholic also.*

This observation is not to be construed as supporting either prohibition or temperance, but as an effort to instill in the minds of all individuals concerned that *there is a time and place for everything.*

Productive hours, working hours, are not the time to partake of alcoholic beverages.

Individuals should be cautioned to refrain from the use of alcohol if they are taking internal medication of any sort, unless they have checked with their physician and received the green light to do so.

In Short

This has not been an attempt to discuss the problems of alcoholism and the alcoholic in industry, but an attempt to point out the pitfalls and potential dangers involved in the taking of even one or two drinks during an individual's period of productivity.

To sum up:

—Alcohol is not a stimulant, but a tranquilizer or sedative.

—Alcohol should never be used in conjunction with any internal medication whatsoever, unless the individual has been satisfied and assured that it does not have a synergistic effect with the medication.

—Even two highballs or two martinis or two beers can raise the blood alcohol level to the point where an individual's ability to function may be sufficiently impaired to interfere with productivity and safety.

—Management, down to the lowest echelon of supervisory personnel, should accept the responsibility of enforcing a ban on the taking of alcoholic beverages by any individual during his working hours.

—The individual who is suffering from a hangover from excessive

drinking the night before, may constitute as great a risk as the individual who is under the influence of alcohol.

—The individual who violates company regulations concerning alcoholic beverages should be handled in exactly the same manner as any other individual who violates any other regulation. He should be neither more lightly nor more seriously dealt with.

—All employers should acquaint their employees not only with their regulations concerning drinking on the job, but with the *why's* and *wherefore's* of the inherent dangers involved in drinking.

Noise Brochure Available

Bulletin 151, "Control of Noise in Industry," is now available.

It is a pocket-size reprint of the article that appeared in the December 1964 issue of the CSN.

New Elevator Law

Governor Edmund G. Brown has signed Senate Bill No. 900, introduced by Senator J. Eugene McAteer and coauthored by Assemblyman Charles W. Meyers.

This means that by July 1, 1966, *all California elevators equipped with a photoelectric tube device that controls the closing of automatic power-operated elevator doors must be equipped with a switch which, when actuated, will render the photoelectric tube device ineffective.*

The switch must be clearly labelled *"To be used in case of fire only."*

There have been times when smoke from burning buildings has interrupted the photoelectric beam, thus making it impossible to close elevator doors.

In one such case, a fireman was fatally injured, and another seriously hurt, when they were trapped in an elevator at a floor that was on fire.

SB 900, which adds Section 7321 to the Labor Code, should put an end to that hazard.

"Quick" Comes to Life Again!

By KYLE J. LUTZ, Safety Engineer, Division of Industrial Safety

With the price of quicksilver soaring, the slumbering quicksilver mining industry has again awakened and stretched its limbs.

Mine owners have welcomed the rise in price—some \$600 for a flask of 76 pounds—but have tempered their optimism with caution, as the history of quicksilver is notable for wide and abrupt ups-and-downs in price.

One question puzzles mine owners.

Will the price of quicksilver remain high enough, long enough, to make it profitable to reopen flooded and gas-filled mines, and to recondition or replace run-down mine and mill equipment?

Only a soothsayer can give a definite answer.

Long Mined in California

Quicksilver to the geologist, *mercury* to the scientist and trade, and "*quick*" to the miner, is found in many parts of the world.

The most important mercury mines in Europe exist in Spain and Italy, which have produced a large share of the world's quicksilver in the last six or seven hundred years.

In this country, most of our quicksilver comes from California and Texas. In fact California began mining quicksilver well before the state became a part of the Union in 1850.

The "water silver" (Greek *hydrargyros*) is a silvery white metal which is liquid at ordinary temperatures. It occurs native in its metallic form; but the bulk of it is obtained by distilling the sulphide, cinnabar.

Quicksilver is found in true veins, in veinlets, in impregnations and disseminations through a formation, and as a coating on the rocks of a formation.

The deposits are closely associated with hot spring and geyser areas, in

some instances active, but usually ancient or inactive.

Quicksilver mining is as a rule complicated by one or more of the following conditions:

- heavy ground
- hot mineralized water
- excessive water
- hydrogen sulphide gas
- methane gas
- carbon dioxide gas
- sulphur dioxide gas
- oxygen deficiency in the atmosphere in the mine

Hazards of Mercury

Liquid quicksilver vaporizes slightly at room temperatures. Its odorless and colorless vapor is highly toxic, and produces cumulative effects.

Because mercury and almost all compounds of mercury are poisonous, miners and mill men must be provided with effective sanitary facilities. These include change rooms with clothing lockers, shower baths, and pure running drinking water.

Employees exposed to mercury should wash before eating and at the end of a shift.

The hazards of swallowing mercury even in small quantities are serious. During working hours, therefore, great care must be taken not to place in the mouth anything that may have been contaminated with mercury. Candy, tobacco, smoking pipes, cigars, cigarettes are among the more common things to check in this respect.

Still more serious is the hazard of inhaling mercury from mercury dust, fumes, and compounds.

A person could develop chronic mercury poisoning by working eight hours in an atmosphere containing no more than one-tenth of a milli-

gram of mercury per cubic meter, and acute mercury poisoning if the concentration were about twice that much.

Some symptoms of the early stages of mercury poisoning are metallic taste, foul breath, skin rash, increased flow of saliva, inflammation of the mouth and gums, constipation, timidity, and mental depression.

Later symptoms are ulceration of the mouth and gums, anemia, pain or numbness of the limbs, and body tremors.

Exploratory Tests Essential

Before reopening a mine, it is usually advisable or necessary to explore and determine the condition of the underground workings. Such exploratory activities may be quite hazardous.

The atmosphere must be tested for the presence of methane and hydrogen sulphide, by means of proper test apparatus. (The DIVISION OF INDUSTRIAL SAFETY'S mining engineers gladly assist in such tests.)

Possible oxygen deficiency of the atmosphere must be determined. Dependence on the flame of a carbide light is unsafe, and has sometimes resulted in death. A flame safety lamp or a candle flame will indicate whether there is sufficient oxygen.

During exploration trips, tests should be made of timber, roof, and wall conditions to check against cave-ins or rock falls.

If any unsafe conditions are discovered that would endanger further explorations, they must be corrected before proceeding farther.

The exploration will reveal where and how much timbering is necessary.

Before Resuming Operations

It frequently happens that all or part of a mine must be dewatered before mining can be resumed (or even before exploration can be completed).

The presence or absence of gases must be determined.

Where necessary, shaft timbers and ladders must be reconditioned or replaced.

Electrical power for pumping must be installed according to the *Electrical Safety Orders*, and must be maintained in good condition.

Adequate ventilation of a mine must be established. If there are gases present, forced mechanical ventilation must be provided. If adequate and continuous air is circulated to all active workings, gases will not accumulate in dangerous concentrations.

When access to the mine is through a shaft, then the hoist, signal system, shaft, head frame, and hoisting rope must be in safe operating condition, conforming with the *Mine Safety Orders*.

Particular attention must be given to the hoisting rope. If it has ever been used, it must be internally inspected for corrosion, rust, and wear. Inspecting a section cut off near the skip, cage or bucket end of the rope will usually reveal any such defects.

If there is any doubt about the condition of a hoisting rope, replace it.

The reopening of a mine sometimes includes connections with other old workings which may contain large volumes of water. If these connections are made at a lower level, an inrush of water could trap or drown workers.

The *Mine Safety Orders* specify safe means of approaching flooded underground workings. These include maintaining drill holes ahead and to each side of workings.

Surface Plant Precautions

The surface plant must be overhauled and made safe.

Explosive magazines must conform with the *Mine Safety Orders*.

Excessive dust at crushing units and kiln feeders must be controlled.

Kiln rings must be kept tight to prevent leakage of dust, vapors, and gases.

The condenser system must be overhauled if necessary.

Special ventilation must be provided for men working inside kilns, condenser stacks, and flues, as a protection against mercury or mercury dusts and vapors. Without this special ventilation, hot work (such as riveting or welding) might vaporize entrapped mercury and generate harmful quantities of mercury vapors in enclosed spaces.

Mercury fumes must be controlled or safely exhausted. The hoeing table or hoeing pan must be provided with exhaust ventilation *with the inlet vent located at table level or below*.

Free "Quick" Problems

Mines containing free quicksilver (metallic mercury) have special problems, and it is advisable to con-

sult the DIVISION OF INDUSTRIAL SAFETY in such cases.

The DIVISION can furnish information on sulphur spraying practices and procedures that will effectively prevent injurious quantities of mercury vapors from escaping from the free quicksilver. Without such spraying, there is the hazard of acute mercury poisoning.

Tremendous Demand

Ever-increasing use of quicksilver in this country and abroad is behind the tremendous demand for quicksilver.

Mine owners realize this, and are attempting to meet that demand.

They have two responsibilities—producing enough quicksilver for the nation's needs, and producing it with maximum safety for the men who work the mines.

TEN-MONTH BOX SCORE
Disabling Work Injuries and Deaths ^a in California

Month	Disabling Work Injuries			Deaths ^a		
	1964	1963	1962	1964	1963	1962
January	14,534	14,437	13,713	63	43	56
February	13,911	12,622	12,014	60	48	20
March	16,066	13,289	12,640	56	57	83
April	15,514	14,157	15,172	62	57	30
May	14,944	13,520	14,463	56	58	73
June	15,023	13,352	12,567	64	36	60
July	16,847	17,267	15,617	50	67	79
August	16,347	15,089	14,403	64	54	60
September	16,065	16,915	14,864	60	89	60
October	15,255	16,906	15,952	67	49	61
10-month total	154,506	147,554	141,405	602	558	582

Injuries up 4.7% from 1963
Employment up 3.5% from 1963

^a January 1964, the definition of a "work fatality" for statistical purposes was revised to exclude all compromise and release settlements, except where the sole issue was dependency. Monthly fatality totals for 1962 and 1963 have been revised to conform to the new definition.

(Source: Division of Labor Statistics and Research)

Man and the Aquatic Environment . . .

by JAMES R. STEWART, Diving Officer
University of California at San Diego
Scripps Institution of Oceanography

[With science looking more and more to the vast areas below the surface of the ocean to provide essential foods and minerals for this and future generations, and with underwater work rapidly achieving the status of an industry, we are happy to present this article by an authority in his field.—Ed.]

Pictures (except that of the author) are reprinted by courtesy of the U.S. Navy

In order to appreciate the problems of men working in the underwater environment, we must first look at man—a warm blooded, air-breathing, terrestrial animal—and briefly review his underwater accomplishments.

As far back as 495 B.C., man worked below the surface of the sea. He simply took a breath and submerged for forty-five to ninety seconds—as long as he could hold his breath.

Without a “window” such as a face mask or goggles through which he could see clearly—they had not yet been invented—he could not do much detailed work underwater or make any lengthy observation of the underwater scene.

Water temperatures also limited early divers, as they had no protection against cold.

The Diving Bell

A major breakthrough was the development of the diving bell, which can be lowered over a given spot and enable its occupants to work in a dry space for short periods of time.

The limiting factor here was the depletion of oxygen and buildup in the bell of respired carbon dioxide.

The bell was later improved by a means of delivering a continuing supply of fresh air to it. This was accomplished by inverting buckets on the surface, pulling them down full of air, and righting them under the bell.

The advent of air compressors allowed bells to go to lower levels, and extended the time available for work.

An obvious offshoot of the diving bell was the leather hood with a glass

window for vision and a hose to the surface air compressor.

A further step was the metal “hard hat” and diving dress, which has remained essentially the same for a hundred years.

The “hard hat” diver is tethered to the surface for air supply. He has a suit that is filled with air and that must be kept at the pressure of the surrounding water.

Any overpressure of air will cause the dress to balloon, and the force will cause the diver to rise to the surface rapidly.

Rapid ascension can lead to several life-threatening physiological difficulties, discussed a little later.

A sudden reduction of pressure or volume in the diving suit can lead to the classic suit squeeze. The pressure of the water crushes the diver's body and jams it up into the incompressible helmet.

Fortunately, safety devices have been developed and utilized which virtually prevent this type of accident.

The suit diver must wear weighted shoes to keep his feet below his head. He is therefore a very cumbersome individual, best adapted for working on level areas or from a platform or stage lowered from a ship.

Scuba

In 1942 a new device, the aqualung, came into use. It is an underwater breathing apparatus consisting of a cylinder or cylinders of compressed air and a watertight face mask, with the air supply carried on the back of the diver.



The author

A pressure regulator is used to reduce the high pressure air (2,000–3,000 pounds per square inch) in the cylinders and deliver it to the diver at pressure equal to that of the surrounding water.

The aqualung type of equipment soon became known as “self-contained underwater breathing apparatus”—abbreviated to the acronym *scuba*.

The new device gave man the ability to move freely through the water in three directions—upwards, downwards, and sideways.

Underwater, he normally wears a face mask in order to see; a pair of swim fins on his feet as a means of propulsion; and, in deep diving or temperate waters, some type of protective suit to combat cold.

The physiological difficulties inherent in underwater work are the same, regardless of the equipment used.

Man using air as a breathing medium is limited by its components.

The partial pressure of oxygen in the breathing medium must be kept *below* a pressure equal to breathing 100% oxygen at two atmospheres absolute or a depth of 33 feet of sea water.



Aquanaut securing the entry hatch leading to dwelling in an oxygen-helium atmosphere

When using air which contains about 21% oxygen, this critical pressure is reached at about 300 feet. Long before this depth is reached, however, the concentration of nitrogen in the air causes *narcosis*—a state of stupor or insensibility similar to drunkenness—which of course seriously impairs the mental and physical abilities.

Individuals working below 200 feet are not too productive.

The mechanics of narcosis are not fully understood; but we know that symptoms vary from individual to individual, and in a given individual even from dive to dive.

Effects of Helium

To eliminate the narcosis problem, an artificial breathing medium composed of helium and oxygen has been tested by the Navy, and is currently used by the Navy and many civilian divers at levels below 200 feet.

While it has eliminated the narcosis problem, the helium has produced several undesirable side effects.

One is that helium has a greater thermal conductivity than nitrogen, thus causing a diver to lose excessive amounts of body heat. Another is that helium causes a change in vocal

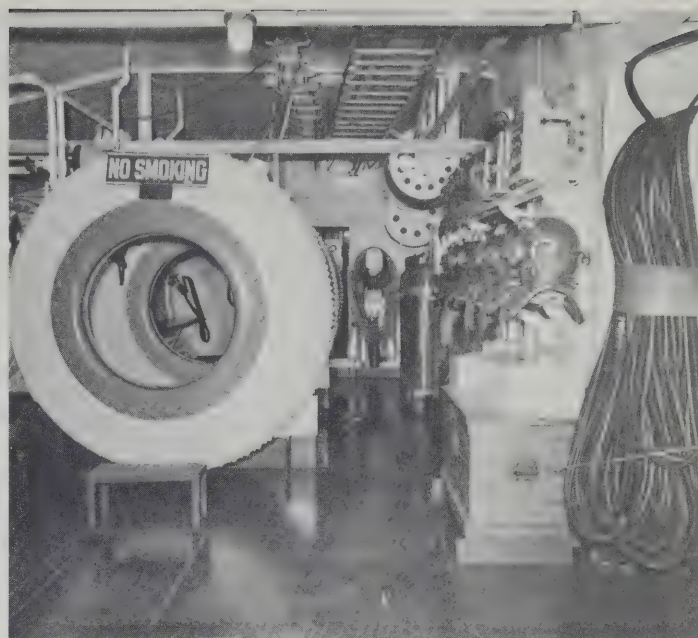
frequency, to give a non-understandable "Donald Duck" sound effect to a diver's speech.

One of the most serious hazards to guard against in working underwater at high pressure is rising to the surface too rapidly after a prolonged time at depths greater than 33 feet.

The body becomes charged with the inert gas or gases in the breathing medium. The average person will have approximately one liter of inert gas dissolved in the body tissues at sea level (one atmosphere absolute).

If he dives to a depth of 100 feet (or four atmospheres absolute) for a prolonged period, the body will come into equilibrium with the surrounding pressure and hold about 4 liters of inert gas at that depth. He should then make sure to surface at a slow enough rate that will allow the inert gas to flow from the tissues to the circulatory system and be transported back to the lungs, where it is released.

If the diver ascends too rapidly for this orderly process to take place, the result in the body is essentially the same as happens when we shake a carbonated beverage and then remove the cap.



Room of rescue barge. Note recompression chamber (at left), conventional "hard hats," and air hoses (at right).

Fortunately, the United States Navy and other groups have worked out tables of safe surfacing rates from work at various depths and varying periods.

Surfacing at *safe* rates will prevent bubbles from forming and causing inert gas embolism, commonly called *caisson disease*, *decompression sickness*, or *the bends*.

A second and less frequent source of diving injuries is that of air embolism. This is also a type of gas embolism, but it is formed in a different manner.

While *the bends* are the result of pressure reduction that causes the inert gas dissolved in the system to form bubbles, air embolism is caused by the overexpansion of air in the lungs. This may cause a mechanical rupture of the alveolar wall, allowing a mass of air to enter the pulmonary circulatory system. The air bubbles are then pumped back to the heart, where they may cause a stoppage, or pumped into the systemic flow, where a fatal blockage of circulation may occur.

There are several other types of diving distress.

One is carbon dioxide excess, due to lack of proper ventilation.

Another is carbon monoxide poisoning, which may be due to any of several things: a breakdown of lubricating oil in a compressor; the air intake too close to an exhaust; or the filling of a *scuba* tank from a source of air containing a small amount of carbon monoxide, and then diving to a depth where the increased partial pressure of the carbon monoxide becomes toxic.

Other types of diving hazards are for the most part environmental: the state of the sea, currents, water visibility, bottom type, temperature, and animal life.

Sharks pose an extreme danger in some areas. Other potential dangers are moray eels, electric rays, cone snails, and sea snakes, which possess a venom similar in effect to a cobra's.

(Cone snails, which have a built-in dart gun by which they capture food, possess a neurotoxin which has caused death to man.)

Coelenterates of various types—such as jellyfish, fire coral, Portuguese man-of-war, to name a few, are found throughout the world.

These invertebrate animals constitute a danger to the individual diver who is not properly trained. *For this reason, training in use of equipment and emergency procedures in various environments is essential.*

For his own safety, the diver must *understand* the physical and physiological problems of diving, and the effects and hazards of the environment in which he works.

The suit diver is greatly limited in his depth capabilities and in the amount of time he may safely spend working under pressure.

Several years ago a diver using a mixture of helium and oxygen made a 600-foot dive *for four minutes bottom time*. The time required to bring the man *safely* back to atmospheric conditions was approximately *eleven and one-half hours!*

The *scuba* diver is limited to the amount of gas he can carry around on his back or receive in shallow water through a hookah hose.

Undersea Habitations

To extend his time and increase depth capabilities, undersea habitations have been created and are currently being tested. It is hoped that they will allow man to live and carry on work at depths of 1,000 feet or more.

These houses and structures have been designed and built by many, including Captain Jacques Yves Cousteau of France, Edwin A. Link of the United States of America, the Russians, and the United States Navy under the leadership of Captain George F. Bond.

A man residing in an underwater house will be living in a dry atmosphere, probably either a mixture of helium and oxygen, or a mixture of helium, nitrogen and oxygen, depending on the depth of the house.

A person spending thirty hours at a given depth could just as well spend thirty days there, because the body will come into equilibrium with the surrounding pressure in about thirty hours.

And whether the person stays there thirty hours, thirty days, or thirty months, the time required for him to surface safely will not vary.

Mr. Link calculated that a man living in a submerged house at a depth of 430 feet could work for short periods of time to a depth of 700 feet and return to the house without any decompression problems.

A Glimpse of the Future

Man will be able to work from his underwater house either with *scuba* or *hookah* to furnish the breathing gas.

He will carry communication gear of various types with him to talk to the house, to his partner, or to the surface.

To locate objects in the dark, he will have hardware such as the small portable sonar that is now available.

He will probably have a satellite

house for work when he needs a dry environment.

For distant operations he will have at his disposal small dry vehicles with which to make surveys, map areas, and do work at depths greater than man can reach with current conventional methods.

He will also have vehicles to use for transportation from a central location to more distant work sites. Once there he will be able to exit, work on a project, re-enter the vehicle, and either be transported in a chamber (remaining at bottom pressure) to the surface for decompression, or return to his underwater house.

Some of these types of equipment are now available, and many more are in the offing.

It is plain that the present generation has not only pushed back the frontiers of *outer space*, but has partially removed the barriers of *inner space*.

Many of the problems faced by astronauts in space are shared by "aquanauts" in the underwater environment.

Among these problems is weightlessness, which in space and under the sea is quite similar. Hence the similarity of tools needed with which to work while weightless.

A person using conventional tools to tighten a nut or bolt will find it is *he* who moves, not the object.

Among other things, there is a need in *both* environments for a special breathing gas, and for special protective suits.

With the increased interest in the underwater environment and the current "Man in the Sea" program in full swing, we hope to attain many objectives.

Probably the most important will be the means for man to enjoy the same freedom and the same ease of carrying on his research, study or work in the underwater environment as he enjoys in his everyday terrestrial life.

Control of Hay Bale Stacker Hazards . . .

Great advances have been made in handling baled hay, at least in California, where modern machinery has practically replaced the hay hook for this work.

The mechanical hay bale stacker, one of the newest aids to the farmer, picks up baled hay in the field and automatically stacks it in place.

Like so many other technological improvements, however, the hay bale stacker's automatic features produce new hazards that must be controlled. These hazards have already been the cause of many disabling injuries and no fewer than eight deaths.

The stacker, which may move under its own power or be hitched to a tractor, has a pickup device that places two bales of hay on a shelf called the number one table.

When the two bales slide onto this table, they trip a lever, and the two bales are transferred to the number two table.

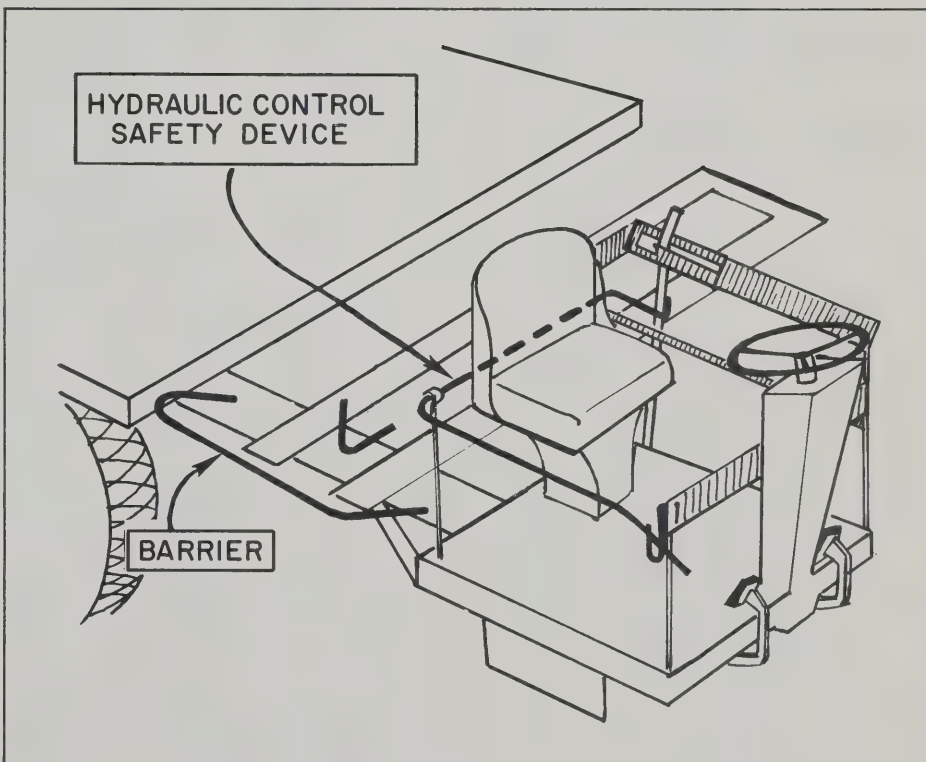
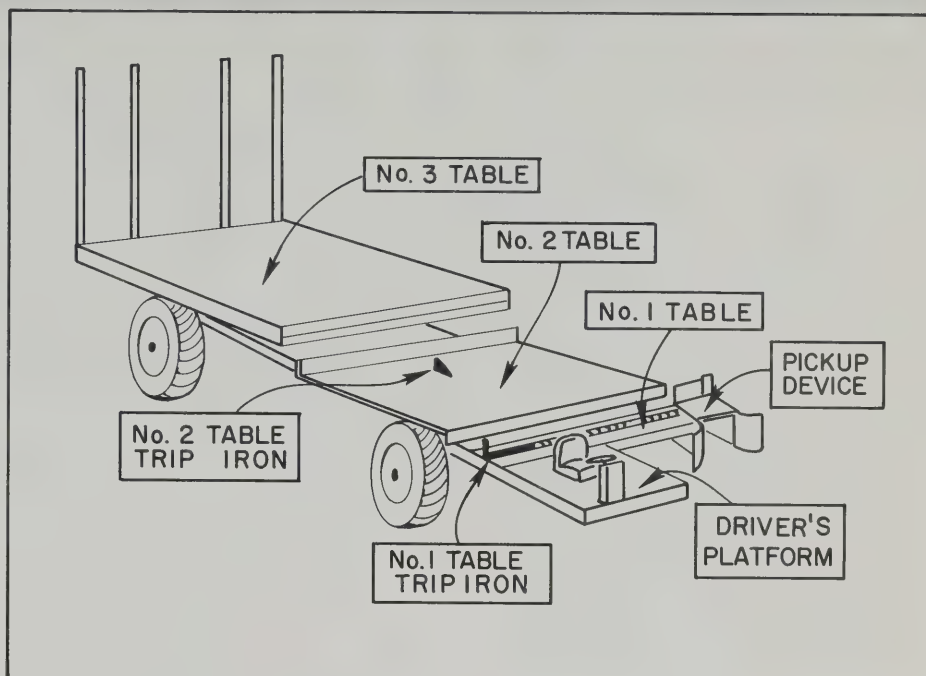
Eight bales fill the number two table, at which time they are automatically transferred to the number three table.

The process is repeated until the hay bale stacker is full.

All three tables are operated hydraulically, and any faulty functioning of the system can result in an accident and possible injury.

If any failure occurs and the hydraulic system is not shut off or disconnected, the operator, in trying to correct the trouble, may be in a perilous position, for the accidental moving of a lever could actuate part of the stacker, to result in amputation of a limb and even death.

Consultation between safety engineers of the DIVISION OF INDUSTRIAL SAFETY and the manufacturer has led to safeguards and other protective devices that are easy to install.



The sketch shows a method by which the operator *must* turn off the hydraulic system when he leaves his working position at the operator's seat.

A bar, attached to the hydraulic control lever, extends around the

seat and across the entrance to the driver's platform.

To leave his position, the driver must either raise or lower the bar, in either case disengaging the hydraulic control lever and shutting off the power.

Disabling Work Injuries^a and Injuries Per 1,000 Workers, by Industry, California, 1962-63

by the Division of Labor Statistics and Research, California Department of Industrial Relations

INDUSTRY	1963		1962	
	Number of Injuries	Injuries per 1,000 workers ^b	Number of Injuries	Injuries per 1,000 workers ^b
All industries.....	173,475	31.8	166,008	31.5
Agriculture.....	16,474	68.7	16,104	65.6
Mineral extraction.....	2,086	70.2	2,165	71.7
Metal mining.....	100	62.5	151	88.8
Crude petroleum and natural gas production.....	508	73.3	532	75.7
Nonmetallic mining and quarrying.....	1,478	63.8	1,482	56.8
Construction.....	26,940	81.9	24,754	80.4
Building contractors and operative builders.....	8,641	86.1	7,544	81.2
General contractors, other than building.....	4,808	72.5	5,136	77.8
Special trade contractors.....	13,491	83.1	12,074	81.1
Manufacturing.....	42,827	30.7	41,744	30.2
Food and kindred products.....	10,048	61.4	9,695	59.1
Textile mill products.....	275	39.3	243	36.8
Apparel and other fabricated textile products.....	820	13.2	782	12.9
Lumber and wood products (except furniture).....	5,278	102.9	5,158	100.4
Furniture and fixtures.....	1,769	55.3	1,568	50.6
Paper and allied products.....	821	27.3	801	27.2
Printing, publishing, and allied industries.....	1,607	21.4	1,625	22.0
Chemicals and allied products.....	1,256	28.4	1,238	28.6
Petroleum products.....	369	12.7	327	11.2
Rubber and miscellaneous plastics products.....	1,231	46.3	1,276	49.1
Leather and leather products.....	122	21.4	180	31.0
Stone, clay, and glass products.....	2,176	45.5	1,988	44.2
Primary metal industries.....	2,305	45.1	2,270	43.7
Fabricated metal products.....	4,377	46.3	4,374	46.7
Machinery (except electrical).....	2,855	30.3	3,033	32.5
Electrical machinery, equipment, and supplies.....	2,495	11.9	2,469	11.6
Transportation equipment.....	3,409	15.5	3,221	14.7
Motor vehicles and equipment.....	889	28.3	786	25.9
Aircraft and parts.....	1,568	9.2	1,570	9.1
Ship and boat building and repairing.....	400	37.0	440	39.3
Other transportation equipment.....	552	N.A.	425	N.A.
Instruments and related products.....	533	18.8	432	16.1
Miscellaneous manufacturing industries.....	1,081	N.A.	1,064	N.A.
Transportation, communication, and utilities ^c	14,385	38.5	14,834	40.2
Street, highway, and local railway passenger transportation.....	1,314	50.2	1,247	47.4
Motor freight transportation and warehousing.....	6,654	87.0	6,632	88.8
Air transportation and allied services.....	848	27.1	1,100	36.4
Other transportation and transportation services.....	963	N.A.	943	N.A.
Communication.....	578	5.8	574	6.0
Utilities.....	4,028	N.A.	4,338	N.A.
Trade.....	31,501	26.9	29,816	26.6
Wholesale.....	8,074	25.9	8,090	26.7
Retail.....	23,427	27.3	21,726	26.6
Building material, hardware, and farm equipment.....	1,854	45.0	1,730	43.4
General merchandise.....	2,568	16.6	2,323	15.9
Food stores.....	4,770	38.8	4,395	37.0
Automotive dealers and gasoline service stations.....	4,819	33.7	4,599	34.4
Apparel and accessories.....	508	8.5	503	8.5
Furniture, home furnishings, and equipment.....	1,087	26.3	972	24.4
Eating and drinking places.....	6,189	31.1	5,632	29.7
Miscellaneous retail trade.....	1,632	17.2	1,572	17.3
Finance, insurance, and real estate.....	2,293	8.2	2,050	7.7
Service.....	16,006	16.5	15,566	16.9
Hotels and lodging places.....	1,746	29.6	1,631	28.8
Personal services.....	1,345	15.0	1,395	16.1
Business services.....	2,351	17.5	2,196	17.9
Automobile repair services and garages.....	1,993	51.1	1,869	51.2
Miscellaneous repair services.....	761	42.3	747	43.2
Motion pictures.....	499	12.8	452	11.4
Amusement and recreation services.....	1,412	29.6	1,469	31.6
Medical and other health services.....	3,073	17.6	2,912	18.2
Miscellaneous services.....	2,826	N.A.	2,895	N.A.
State and local government ^c	20,878	32.2	18,891	31.5
State.....	4,361	26.2	4,380	28.2
Local.....	16,517	34.0	14,511	32.5
Industry not reported.....	85	----	84	----

^a Disability causing absence from work for a full day or shift beyond the day of the injury.

^b 1963 rates are preliminary, being based on employment figures that are subject to revision.

^c The number of injuries to employees of publicly operated utilities is included in the injury figures for the transportation, communication, and utilities division; however the rate of injuries is included in State and local government injury rates.

N.A.—Information not available.

Yours for the Asking

To those interested in accident prevention in industry, a number of publications of the DIVISION OF INDUSTRIAL SAFETY will be of value.

They are yours for the asking—free!

For obvious reasons, we do not send more than three complimentary copies of any brochure to anyone outside the State.

Bulletin 103, "Safe Handling of LP-Gas," gives the use and characteristics of LP-Gas, and the rules and standards that govern safe handling.

Bulletin 104 (Rev.), "Ground It!" explains the necessity and wisdom of grounding electrical hand tools.

Bulletin 105 (Rev.), "Shoring of Trenches," gives safety measures that would eliminate cave-in accidents and injuries.

Bulletin 106, "Ladders on the Farm," gives ladder pointers which, if followed, will reduce the high rate of disabling injuries caused by poor farm ladders and improper use of sound ladders.

Bulletin 107, "The Ship-Shape Shop," shows how good housekeeping and maintenance will save lives, limbs, and money.

Bulletin 108 (Rev.), "Taming the Circular Saw," deals with a most useful but dangerous wood-working tool.

Bulletin 110, "Tips for Hotel Workers," shows that hotel worker accidents are easily prevented if a few simple tips are followed.

Bulletin 111, "Farm Safety Check List," is a safety guide for everyone on the farm.

Bulletin 117, "Stop Grinding Out Injuries!" is about the abrasive wheel, and gives pointers which, if observed, will eliminate almost all grinding wheel injuries—of which over half are eye injuries.

Bulletin 120 (Rev.), "Safety Rules for Painters," tells you the four things that cause four out of five injuries to painters, and shows you how to prevent such injuries.

Bulletin 121 (Rev.), "Ladder Safety—Step by Step," shows that there is no bad luck about ladders when you observe three common-sense precautions.

Bulletin 122, "Handy Rules for Hand Tools," describes the proper care and use of such tools as files, screwdrivers, wrenches, chisels, hammers, knives, and handsaws.

Bulletin 124 (Rev.), "Safety Rules for Roofers," analyzes roofer injuries in a 12-month period and tells how to prevent them.

Bulletin 125 (Rev.), "Are You Using Carbon Tet?" deals with a chemical that has caused work injuries and deaths.

Bulletin 127, "Look Out for Yourself If You Are Around Crop Spraying," an illustrated booklet directed to the farm worker himself, explains how pesticides can be used safely. (Available in Spanish also.)

Bulletin 128, "If You Work in a Quarry," is for the quarry and open pit mine worker, and points out the things he should keep in mind.

Bulletin 133, "Analysis of California Logging and Sawmill Fatalities," contains a study of logging and sawmill deaths in California, and an injury-prevention program.

Bulletin 135 (Rev.), "Check List of Requirements," a guide for employers, safety engineers, and purchasing agents, shows what they should check for before buying

Bulletin 137, "Skin Trouble Is Plenty Trouble," deals with the most common disease or renting equipment or placing contracts. you can get at work.

Bulletin 138, "Supervision and Explosives Accidents," analyzes explosives injuries in California in a three-year period.

Bulletin 140, "Keep AWAY From Power Lines!" is for any and all workers whose jobs may expose them to the hazards of overhead electric power lines.

Bulletin 141 (Rev.), "Power Hand Saw Safety," gives common causes of power hand saw injuries, and tells how to stop them.

Bulletin 142, "Read and Understand the Label!" reminds us how vitally important it is to read and understand the labels of containers of hazardous chemical and mixtures.

Bulletin 143, "Trade Association Safety Programs," shows the value of such programs and what they can do for you.

Bulletin 144, "The Know-How of Wire Rope Safety," gives information that the man on the job and his boss should know.

Bulletin 146, "Safety In Pipeline Construction," shows how to plan and organize pipeline jobs, and lists safe practices necessary.

Bulletin 147, "The Safe Use of Anhydrous Ammonia in Agriculture," discusses the three most important things which, if remembered, make anhydrous ammonia safe to use.

Bulletin 148, "The Safe Use of Aqua Ammonia in Agriculture," describes the precautions necessary for safe use of aqua ammonia.

Bulletin 149, "A Safety Program for the Small Contractor," explains why a safety program is a must for small contractors, and outlines the essentials of such a program.

Bulletin 150, "Electrical Safety and Swimming Pools," describes precautions that would make swimming pools safe electrically.

Bulletin 151, "Control of Noise in Industry," emphasizes the need for either eliminating or controlling excessive noise, and gives practical methods for doing so.

Bulletin 153, "Electrical Safety on the Farm," points out the many electrical hazards encountered on the farm, and tells how to guard against them.

Bulletin 154, "The Tailgate Safety Meeting," gives pointers on an effective means of promoting on-the-job safety.

Bulletin 155, "Pesticide Regulations," tells how to guard against hazards in the use of poisonous and toxic pesticides containing organic phosphates.

Guard Standards, No. 1, Materials and Construction, gives invaluable advice on constructing guards and selecting the right materials for them.

Guard Standards, No. 2, Stairways and Railings, gives requirements for stairways, railings, entrances to stairways, and floor and wall openings.

Form 634, an 8½" x 11" placard. Safety Responsibilities—Employer and Employee— prescribed in Labor Code. (Available in Spanish also.)

Available Reprints include

Power Press Safety

Transportation of Workers — Current California Regulations

Lifting With Safety (Limit within California: 100 copies for any organization, one copy for any individual)

Noise Outlawed

Noise is often ignored as a factor in health.

But not in San Pablo, California.

San Pablo is the first city in the state to require that multi-family housing units be protected against air-borne sound.

This northern California city has adopted an ordinance setting forth laboratory test requirements for all separating walls and floors.

—Community Health, Bethesda, Md.

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Offices of the Division of Industrial Safety

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SAN FRANCISCO.....455 Golden Gate Ave.....557-1946
Los Angeles3460 Wilshire Blvd.....DUnkirk 1-5695

OTHER OFFICES

Bakersfield	225 Chester Ave.....	FA irview 4-6437
Chico	341 Broadway.....	FI reside 3-5182
Eureka	619 Second St.....	HI llside 2-5748
Fresno	2550 Mariposa St.....	AM herst 8-7151
Long Beach	230 East 4th St.....	HE mlock 2-8443
Merced	550 W. 22nd St.....	723-4561
Oakland	1111 Jackson St.....	TE mplebar 4-3460
Redding	2115 Akard Ave.....	CH estnut 1-5100
Sacramento	1107 Ninth St.....	445-5818
Salinas	307 Soledad.....	424-4807
San Bernardino	478 West Base Line.....	884-6461
San Diego	1350 Front St.....	232-4361
San Jose	888 North First St.....	CY press 4-1525
Santa Ana	1619 W. 17th St.....	547-1603
Santa Barbara	411 E. Canon Perdido.....	966-2918
Santa Rosa	306 Mendocino Ave.....	542-8802
Stockton	807 N. San Joaquin St.....	HO ward 6-3412
Ukiah	305 N. Main St.....	HO mestead 2-8850
Ventura	3418 Loma Vista Road.....	642-9679



331.8205

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"Management's Responsibility for Safety"..... Page 12

"Labor's Responsibility in Job Safety"..... Page 4

Injury Trends in California..... Page 8

Part of the throng at the general assembly of the Conference



Vol. 49, No. 1
March 1965

California Safety News

California Safety News

Vol. 49, No. 1, March 1965

The California Safety News is mailed free of charge to those interested in industrial safety

Revised Construction Safety Orders...

Revised Construction Safety Orders were adopted by the Industrial Safety Board in March, setting the stage for what Governor Edmund G. Brown describes as an "all-out attack on death and injury to construction workers."

Labor and management, the two great segments of California industry, deserve much praise for their contribution to the revised Orders.

Lively difference of opinion marked the many meetings, large and small, held during the two years that it took to complete such a major revision. It is to the credit of labor and management that the differences were harmoniously resolved, after full and complete discussion and exchange of ideas.

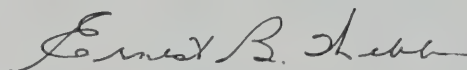
The revised Orders contain necessary changes and additions to cover new methods, new processes, and new machines introduced by new technologies in construction, an industry in which California leads the nation by a wide margin.

Major changes include

- control of surface drilling dust
- a safety program for all construction contractors
- greater control of electrical hazards peculiar to the construction industry
- increased use of safety belts and safety nets
- requirements covering falsework and vertical shoring of concrete construction
- access to multistory buildings while being built, and
- improved regulations for shoring of trenches.

I am confident that labor and management will make every effort to abide by the intent and spirit of the new regulations.

The hoped-for result is a steady and welcome decline in the rate of injury and death in a giant California industry.



In This Issue...

For Daniel P. Bryant's opinions on *Management's Responsibility for Safety*, turn to page 12.

B. A. Gritta's views on *Labor's Responsibility in Job Safety* are given on page 4.

Recent Convictions for Violations of Safety Orders are recorded on page 8.

In 1964, disabling work injuries rose at a faster rate than employment, according to the *Seven-Month Box Score*. Page 7.

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Summary of the 1965 Conference . . .

With stimulating addresses by the two main speakers at the general assembly, and excellent programs at the separate Section meetings that followed, the 15th annual statewide meeting of the Governor's Industrial Safety Conference was outstandingly successful.

The consensus of the more than 1,200 persons who attended the two-day meeting at the Biltmore Hotel, Los Angeles, on February 4th and 5th, was that it was easily one of the finest Conferences to date.

Ernest B. Webb, Director of California's DEPARTMENT OF INDUSTRIAL RELATIONS and General Chairman of the Conference, presided at the general assembly.

He introduced Geo. A. Sherman, Chief of the DIVISION OF INDUSTRIAL SAFETY; members of the Industrial Safety Board; and the featured speakers: Daniel P. Bryant, President of Bekins Van & Storage Company, and B. A. Gritta, President of the AFL-CIO's Metal Trades Department.

In his informative and thought-provoking speech on *Management's Responsibility for Safety*, Bryant discussed management's responsibility and authority in the field of injury prevention, the measures management should take to improve safety performance, the role of unions, and the ways in which labor and management can cooperate in achieving greater progress in work safety.

Bryant stated that management's responsibility for safety on the job is ultimate and final, and one that cannot be shared.

Management must put its own "attitude in order," he said, listing several essentials, including a quotation that has had a profound effect on his own management program: "It is not what you *expect* that will produce results—it is what you *inspect*."

In his stimulating address on *Labor's Responsibility in Job Safety*, Gritta commended employers, labor, and management in California for their interest and effective efforts in work safety, and emphasized the need for "a continuing three-way sharing of responsibility" in that field.

He stressed the value of studies and meaningful statistics on industrial injuries, and labor's vital concern for on-the-job safety of workers.

More and more employees have become convinced that the worker has the greatest stake in job safety, he said, regardless of the legal responsibility of management; and each labor-management agreement should provide for the establishment of a joint safety committee, with responsibilities and authority clearly defined, including steps to make certain that such committees do "not degenerate into meaningless monthly get-togethers."

Following the general assembly, the seven following Sections held separate meetings on the afternoon of the first day and the morning of the second day.

Agriculture
Construction
Governmental Agencies
Manufacturing
Mineral Industries
Trades and Services
Transportation, Communications, Utilities



Geo. A. Sherman
Conference Secretary and Program Chairman

On the whole, the Section programs received much praise, and set a high standard for future programs to follow.

Several of the speeches at the Section meetings will form the basis for articles in the CALIFORNIA SAFETY NEWS.

As usual, the colorful Conference exhibit drew a large crowd, which selected thousands of copies of safety publications prepared by the DIVISION OF INDUSTRIAL SAFETY and the DIVISION OF LABOR STATISTICS AND RESEARCH.

Our Thanks to the DLS&R

As always, no summary of the annual Conference would be complete without mention of the valuable statistical information provided by the DIVISION OF LABOR STATISTICS AND RESEARCH—not only at the two-day meeting, but to Conference sections throughout the year.

Popular Articles

Two of the most popular and widely reproduced articles ever published in the CSN appeared in the September 1964 issue: *An Alphabet of Industrial Safety* and *The Myth of Accident Proneness*.

They have been reprinted in this country and abroad, in places as far apart as Canada and South Africa.

Labor's Responsibility in Job Safety...

(Some highlights of the address by B. A. GRITTA, president of the AFL-CIO's Metal Trades Department)

You here in California—employers, labor and government—are to be commended for your continued interest and effective efforts in the important area of job safety.

You have all been working diligently and cooperatively together on industrial safety problems, and as a result of your combined efforts you have achieved a high position for your state, its industry, and workers in industrial safety. . . .

It is indeed a sad but true commentary that industrial safety does not have the dramatic appeal to make it a front runner in the news or in citizen interest. However, those of you attending these annual safety conferences know how important it is that we keep job safety in the forefront in our industrial life.

Safety is not dramatic. Its importance is all too frequently dramatized by its absence.

An accident involving an explosion, a collision, a fire, a mine disaster, a fall to death—these kinds of shocking accidental occurrences command the front pages and draw the attention of the many, if but only for a brief moment of sympathetic concern in the fast moving pace of life today.

You here in California well recognize that the creation and maintenance of safe and healthy work places, coupled with good safety legislation, thorough inspections and accident investigations, together with the workmen's compensation legislation, are all necessary to an effective industrial safety program, and require *a continuing three-way sharing of responsibility by employers, government, and labor.*



I know that you have asked that I speak particularly on labor's responsibility in job safety, but I do consider it essential that we first at least look briefly at the major responsibilities of the other two partners, as the interests of all three are so inter-related and intertwined.

The employer's responsibilities clearly include an obligation to provide a safe and healthy work place, equipped with properly guarded tools, good ventilation, light, healthful temperatures, adequate and well-kept sanitary facilities, and necessary protective clothing and other safety devices.

The employer's obligation also requires that he see to it that his operations are conducted in full conformity with all applicable safety and health regulations.

He should also see to it that his operating procedures are constantly reviewed and updated and that his work force is well schooled in all safety and health regulations and plant safety requirements which he enforces with equity and fairness across the board.

The obligations of state government in the industrial safety field, include providing sound and comprehensive industrial safety and occupational health legislation which is kept updated to meet industrial and technological changes. . . .

We believe it is also an obligation of the state to make investigations and prepare comprehensive reports and keep detailed and meaningful statistics on all industrial accidents.

Such reports should be made the subject of continuing study and research as a part of a ceaseless endeavor to improve protective standards, eliminate unsafe devices and practices, and thus to foreguard against future, similar accidents.

Unfortunately, many of our basic industrial safety requirements today had their genesis in disabling and death-dealing accidents of the past.

It is sad but still true that all too frequently workers serve as the guinea pigs in the evolution of safer work places. . . .

Labor's Part

Now let's turn to examine labor's part of the responsibility for on-the-job safety. Organized labor's interest in safety and occupational health goes back well over 50 years. We are well aware that in the past our progress in these fields has been made largely as a result of the loss of life and limb in industrial accidents.

Back when the trade union movement did not have the degree of acceptance and recognition which it has today, the very thought of workers, through their trade unions, participating in the solution of occupational safety problems was viewed as an outright invasion of management rights.

Even today, we still occasionally find an employer who holds to the old view that job safety is exclusively a responsibility of management and is not to be shared with the workers through their unions.

Fortunately, however, with the growth of full-fledged recognition of the trade unions, and the growth of collective bargaining as the only democratic way to determine employment conditions, we have been able to convince more and more employers that *the worker has a real and vital stake in his job safety*—that job safety is a vital part of his daily working conditions—and that obtaining safe and sanitary places of work is of just as much concern and interest to the worker as are wages, hours, and other employment conditions.

As we have moved forward with our employers in a growing recognition of the fact that job safety is something we share an interest in, and as we have grown in our collective bargaining relationships, *we in labor have come to see that we now must focus our attention more and more on the prevention of job accidents* rather than to concentrate on the promotion of workmen's compensation legislation and in getting better care and rehabilitation for those suffering job disabilities.

We in the trade unions are coming to realize that job safety—accident prevention—must come first.

It has, or should have, a meaning to the worker which transcends its meaning to all others.

His physical well-being is directly at stake. As workers, we must not only stay alive, but we must maintain our health and physical abilities to perform our jobs. Only in this way can we be assured of the opportunity to enjoy the substantial gains and improvements in our wages and conditions of employment which we are constantly obtaining through collective bargaining.

What good are the job improvements gained through bargaining if we cannot stay on the job to receive them? Even with all collective bargaining gains, our job security is still directly dependent on our job safety.

All of the benefits and gains which we have built together over the years through collective bargaining can only be fully realized if we maintain our physical ability to perform our work.

Our job security is dependent on our job safety, and accident prevention is the keystone of job safety.

Therefore, it behooves us in the trade union movement to represent our membership on job safety and accident prevention matters just as vigorously and thoroughly as we do on the so-called "bread and butter" issues of collective bargaining.

We must first of all arouse our members from their lethargy.

We all have a human tendency to think that it can't happen to us. Figures prove that it can and does. . . .

We as workers sometimes tend to forget that while our bodies have marvelous recuperative powers given to us by our Creator, even such powers have limits.

We can't grow a new hand to replace one lost in an unguarded machine, nor can we reproduce an eye to replace one pierced by a steel splinter. . . .

The collective bargaining process gives us an opportunity to negotiate with management on needed and desired improvements in the safety and healthfulness of our work places.

Each of our agreements should provide for the establishment of a joint safety committee, delineating its responsibilities and its authority.

We must make certain that the functioning of such joint committees does not degenerate into meaningless monthly get-togethers.

Our members on such committees must be selected with care. We must make certain that they do have a real interest in this field. They must be alert to the keen charge of their responsibility to ceaselessly pursue improvements in the safety and health of the work place.

Most employers today are aware of the many safety benefits which

flow from participation of the workers and their unions in job safety responsibilities.

It would be impossible to estimate the number of lives saved and the number of limbs *not* lost as a result of constructive improvements in shop and job safety practices made upon the suggestions of those who man the shops.

It is the wise employer who cultivates this type of cooperation and gives to the worker a full measure of participation in all shop safety matters, through his joint safety committee members, his union steward, and his trade union organization itself.

Union Obligations

We in the trade union movement have an obligation to see to it that our local unions are properly oriented and urged to give continued attention to safety through the establishment of local union safety committees, which are given a responsibility of participating on behalf of the members in all matters concerning industrial safety and health which could affect local union members and in making periodic and meaningful reports to the membership meetings.

We should see to it that our members serving on plant joint safety committees and our members serving as stewards are schooled and trained to handle problems of job safety and occupational health. They must learn to recognize valid complaints involving actual unsafe practices or conditions and know how to process them to an effective conclusion.

We should encourage our members to note and report to their appropriate safety committeeman or steward any unsafe practices or conditions which they may observe.

Our keen concern with the preservation of the life and limb of our

members requires that we recognize that *each worker has an obligation to avoid unsafe and careless work practices*, and that if he persists in engaging in such unsafe practices or refuses to follow approved safety procedures, the matter should be brought to his attention by his union steward or safety committeeman.

We also recognize that repeated occurrences of unsafe work practices may require the employer to take reasonable disciplinary action against the worker who persists in thus endangering himself and others.

Failure to halt such performance could only lead to a disintegration of safety principles and a growth of carelessness throughout the work force of the plant.

Workers must understand that if they persist in engaging in unsafe work practices, they jeopardize their jobs.

Another particular problem that we must work closely with management on is that of the worker who is unaware of the safe limits and safe practices in connection with the performance of a particular job, the use of the necessary tools or power involved, the use of appropriate protective safeguards, and the need to give proper consideration to the protection of other workers.

A worker who is assigned to perform new operations or work with power tools or materials in which he is not well grounded must be properly schooled in the approved and safe procedure to follow in the performance of such work. . . .

The introduction of new techniques, new equipment, tools, and materials places upon management an obligation to see that its employees are updated in safety procedures with regard to the uses of such techniques, tools, and materials. . . .

We in the Metal Trades Department have gone on record in favor of a program of grants in aid from the Federal Government to stimulate and encourage the development of state safety programs, the employment of trained safety inspectors, the development of effective reporting systems, and other improvements in effective accident prevention through state government.

The total cost involved would be minute when placed alongside of the gigantic amounts of earnings forever lost through disabling job injuries.

It has been estimated that workmen's compensation benefits run as high as one and one-half billion dollars a year and that the cost of uninsured accidents is estimated to hike this figure to well over four billion dollars annually.

When you compound this with the human suffering, heartache, and tragedy which always accompany such accidents, we realize that *the full impact of job accidents can never be measured*, and that any

monies appropriated and spent on effective accident-prevention programs constitute a most worthwhile national investment.

Just think for a moment of the monies presently being spent to train or retrain those who do not have competencies to fill existing employment opportunities.

The skills of our work force are our greatest national asset. We must protect them from accidental loss.

Again may I commend you for the excellent job which you are doing here in California in this vital field of industrial safety.

Of particular importance is the extent to which you recognize the three-way nature of the responsibility for getting this job done.

It can't be left to Government, employers, or labor alone, but your three groups working together as a team and hitting the problem from all sides and angles cannot help but succeed in achieving constant improvement in job safety beneficial to all, and which can serve as a model for others to follow.

Jack Kilsby — "Mr. Elevator" — Leaves the Division

After some 32 years in State employ, including 31 years with the DIVISION OF INDUSTRIAL SAFETY and its predecessor (the IAC's Industrial Accident Prevention Bureau), John S. Kilsby leaves the DIVISION he so long served so faithfully and well.

First employed by the State in March 1933 as a confidential representative, Kilsby joined the Elevator Section of the DIVISION's predecessor in 1934, and over the years earned signal distinction in the field of elevator safety.

His many accomplishments include his contribution to the major revision of the *Elevator Safety Orders (1947)*—regarded as a model of its kind—and to the creation of the *Aerial Passenger Tramway Safety Orders (1956)*, the first "ski-lift" Safety Orders in the country.

Another major responsibility that Kilsby shouldered so well for many years was supervision over the training and work of certified elevator inspectors employed by insurance companies.

The esteem in which "Mr. Elevator" is regarded both by the elevator industry in general, and the DIVISION in particular, was reflected by the large gathering that attended a dinner in his honor in San Francisco this month, and the tributes he received on that occasion.

Speakers praised his influence on the elevator industry and his dedication to service to his fellow man.

At one time active in San Francisco civic affairs, Kilsby has lived in San Rafael for the past nine years.

With no idea of an inactive existence, Kilsby will be available as a consultant in the elevator field.

Letters to the Editor...

The theory of accident proneness was very fashionable in this country many years ago and I had thought the subject to be almost as dead as the dodo. However, the beast has reared its ugly head on a few occasions of late, and Professor Ghiselli's article has appeared at a most opportune time . . . Many thanks for . . . permission to reproduce [it] in the Journal.

—W. A. Friend, Editor
British Journal of Industrial Safety

We have used many of the articles [in the CALIFORNIA SAFETY NEWS] to good advantage and are following close on your suggestions and recommendations, even though the laws do not pertain to our area.

—James C. Denyes, Supervising Engineer
Continental Nat'l American Group, Grand Rapids, Mich.

Our Ministry are very much interested in your *Alphabet of Industrial Safety* and have enquired whether you would consent . . . to this being reprinted . . .

Of no less interest to us is the article by Professor Edwin E. Ghiselli, *The Myth of Accident Proneness*, wherein he has dealt most ably with a subject that has bedevilled us for a long time . . . would very much like, with permission, to have this subject copied for wide circulation . . .

—P. Redelinghuys, Chief Inspector of Factories
Ministry of Labour and Social Welfare
Salisbury, Rhodesia

We have found your booklet *Tips for Hotel Workers* serves exceedingly well in the promotion of our accident prevention program for [two hotel] chains.

—A. M. Anderson, Supervising Safety Engineer
Industrial Indemnity Co., San Francisco

. . . There are many articles [in the CSN] that we believe could be passed on to more of the public and we are wondering if permission could be granted to reprint some of these articles.

An Alphabet of Industrial Safety . . . in my opinion is very good. It seems this would be a proper reprint to place in every business throughout the State of California.

—Roy E. Olander & Co., Los Angeles

This [the CALIFORNIA SAFETY NEWS] is an excellent publication, and this particular number [the December 1964 issue] was most informative, particularly in respect to the construction industry.

—James N. Fenton, Casualty Loss Control Division
Johnson & Higgins

Your publication [the CSN] . . . should prove to be of invaluable aid toward strengthening the safety awareness of our supervisors and be reflected to their subordinates.

—E. W. Tenge, Safety Supervisor
Diamond Walnut Growers, Inc., Stockton

Enclosed please find copies of reproductions of your two bulletins . . . *Ladder Safety, Step by Step* and *Safety Rules for Roofers* . . . I find these bulletins very informative in our field.

—Walter W. Watson, Coordinator
Joint Roofing Industry Apprentice Committee
St. Louis, Mo.

I wonder if we might have your permission to reprint that fine story by Professor Ghiselli.

—Vern E. Randall, Editor, Western Underwriter

Your fine magazine brings many helpful hints and fine articles to assist us in our safety program . . . we are very appreciative.

—Fred O. Mauel, District Superintendent
Southern California Edison Company, Barstow

I find the copies [of the CSN] . . . of great value in furthering our safety program.

—M. S. Burks, Safety Director
Pabst Brewing Company, Los Angeles

I note with interest your recent article, *An Alphabet of Industrial Safety*. I would like your permission to reprint in a future issue of *Safer Oregon* . . .

Let me acknowledge with deep appreciation your publication CALIFORNIA SAFETY NEWS . . . I find it well edited and beneficial to our safety efforts here in the State of Oregon.

—Donald G. Benedict, Editor, Safer Oregon

Letter to the Director

I have reviewed your publication entitled CALIFORNIA SAFETY NEWS, September 1964 . . . and your editor and staff deserve my compliments for the material and especially in the form it is arranged, and I might add I enjoyed your comments on the editorial page.

—Leonard Williams, Commissioner of Labor
Department of Labor, State of Kansas

Letter to the Chief

I appreciate permission to reprint your article in the December 1964 edition of the CALIFORNIA SAFETY NEWS for our Union paper the *Utility Reporter*.

The article *Philosophy and Attitude in Injury Prevention* will be helpful to the members in developing their on-the-job safety attitudes.

—Sam L. Casalina, Local 1245, IBEW, Oakland

Your publication [the CSN] is one of the finest and most helpful that comes across my desk. I enjoyed especially your *Alphabet of Industrial Safety* and would appreciate your permission to use it in our own employee publication.

—John V. Skendall, Safety Director
Harbison-Walker Refractories Co., Pittsburgh, Pa.

SEVEN-MONTH BOX SCORE

Disabling Work Injuries and Deaths^a in California

Month	Disabling Work Injuries			Deaths ^a		
	1964	1963	1962	1964	1963	1962
January	14,534	14,437	13,713	63	43	56
February	13,911	12,622	12,014	60	48	20
March	16,066	13,289	12,640	56	57	83
April	15,514	14,157	15,172	62	57	30
May	14,944	13,520	14,463	56	58	73
June	15,023	13,352	12,567	64	36	60
July	16,847	17,267	15,617	50	67	79
7-month total ---	106,839	98,644	96,186	411	366	401

Injuries up 8.3% from 1963
Employment up 3.7% from 1963

^a January 1964, the definition of a "work fatality" for statistical purposes was revised to exclude all compromise and release settlements, except where the sole issue was dependency. Monthly fatality totals for 1962 and 1963 have been revised to conform to the new definition.

(Source: Division of Labor Statistics and Research)

Injury Trends in California

When the final count is in for 1964, the number of disabling on-the-job injuries in California last year will be around 185,000, according to preliminary estimates.

This is the highest number on record.

It means that the disabling work injury rate will probably exceed 33 per 1,000 workers, compared with the rate of 31.8 per 1,000 workers in 1963.

Changes in Injury Rates

Between 1950 and 1960, the work injury rate in California dropped almost 25%—from 42 disabling injuries per 1,000 workers, to 32.

Since 1960, work injury experience has varied from industry to industry.

Agriculture

In *agriculture*, the rates in 1960 and 1963 were to all intents and purposes unchanged—68.2 and 68.7.

However, in the first six months in 1964, while employment was up 3½%, the number of injuries was up 6.2%.

That means that the *rate* of injuries was up about 2½% (compared with 1963).

Mineral Extraction

In *mineral extraction* as a whole, the rate *advanced sharply* between 1960 and 1963—from 64.2 to 70.2.

This is because the injury rate in crude petroleum and natural gas production soared from 61.5 to 73.3.

However, other sections of mineral extraction vastly improved their performance in the same period.

Metal mining dropped sharply, from 88.9 to 62.5.

Nonmetallic mining and quarrying was down from 66.0 to 63.8.

Between them, these two sections continued to improve in the first half of 1964, with a decline of roughly 7% in the injury rate compared with the previous year.

Construction

Construction has been a major blot in the injury picture.

Between 1960 and 1963 the injury rate advanced from 79.6 to 81.9.

The rate advanced still higher in the first half of 1964—to about 86.

Recent Convictions for

Harry Callaway Construction Company, of 132 Second Street, Upland, was fined \$100 plus \$10 court costs for failure to provide safe shoring of trenches.

In addition, the company was placed on summary probation for three years, and ordered to comply with all construction safety regulations.

Judge Roland J. Brownsberger rendered the verdict in Municipal Court, Pomona Judicial District, on January 11, 1965.

Deputy District Attorney Fred N. Whichello prosecuted.

George Vella Construction Co., Inc., of 1212 E. Huntington Drive, Duarte, was fined \$1,000 plus \$100 court costs, for two violations of Construction Safety Orders.

The main violation was failure to provide safe shoring of trenches—as a result of which a worker suffered several injuries from a cave-in that buried him in six feet of earth.

The other violation was allowing excavated earth to remain along the edge of trenches.

Judge Paul Egly rendered the verdict in Citrus Municipal Court, Citrus Judicial District, West Covina, on November 24, 1964.

Deputy District Attorney Maurice Oppenheim prosecuted.

S. S. Zarubica, of 8550 Tujunga Avenue, Sun Valley, was fined \$200 plus court costs for repeated failure to provide workmen with protection against the hazard of moving earth in trenches more than five feet deep.

He was also placed on summary probation for two years, and ordered to comply with all Construction Safety Orders.

Judge Alice T. Magill rendered the verdict in Municipal Court, Moorpark-Camarillo Judicial District, Camarillo.

Also fined were two supervisory employees involved in the same violation.

Chris Adzovich was fined \$100, Tom Salata \$50 plus court costs. Both were placed on summary probation for two years, and ordered to comply with Construction Safety Orders.

Assistant District Attorney Rex Collings prosecuted.

It is hoped that the addition of 22 construction safety engineers to the Division's staff (late in 1964) will have an impact on the construction injury rate before too long.

Lumber and Wood Products

In *lumber and wood products* (except furniture), the industry with the highest injury rate, there was practically no change in the rate between 1960 and 1963—from 103.5 to 102.9.

This means that one out of every ten workers in lumber and wood products suffers a disabling injury during the year.

The rate rose during the first half of 1964, to roughly 106 injuries per 1,000 workers.

Manufacturing

In *manufacturing* industries (except for lumber and wood products), the 1960–1963 period also witnessed an advance in the injury rate—a rise of about 4½%.

The rise continued in 1964, with the injury rate for the first half of the year up almost 12%.

Transp., Comm., Utilities

In *transportation, communications, and utilities*, the injury rate advanced a little in the 1960–1963 period—from 37.8 to 38.5.

The rate during the first half of 1964 was up about 4%, to roughly 40 injuries per 1,000 workers.

Violations of Safety Orders

Ernest J. Stake Scaffolding Co., of 1215 W. 110th Street, Los Angeles, was fined \$50, and received a suspended ten-day jail sentence with summary probation for one year, for building a wooden scaffold with poor-grade lumber, lack of guardrails, and poor splicing of uprights.

Judge W. Blair Gibbens rendered the verdict in the County Building, Santa Monica, on November 13, 1964.

Deputy City Attorney Marcus O. Tucker prosecuted.

Three earlier cases crowded out of previous issues of the CSN, appear below.

Foster & Kleiser Company, 1350 West Washington Street, Los Angeles, was fined \$500 for allowing a sign panel to come within six feet of an overhead high voltage line, resulting in the electrocution of Edward Zabrowski.

The company pleaded *nolo contendere**.

Judge Leo Freund, of Municipal Court, Division 63, West Los Angeles, rendered the verdict on June 12, 1964.

Deputy City Attorney Noel Slipsager prosecuted.

Andrew Sorgi, a foreman for **William J. Foster, doing business as Pacific Lathing Company**, 14005 Chandler Boulevard, Van Nuys, received a suspended thirty-day jail sentence, with probation for two years, for allowing a crew to work under unsafe conditions despite a previous warning by the DIVISION OF INDUSTRIAL SAFETY.

Judge Paul Roest rendered the verdict in Division 67, Los Angeles Municipal Court, Van Nuys, on July 10, 1964.

Deputy City Attorney Donald Mowat prosecuted.

Wes Hixon, of Fortuna, forfeited bail of \$29 on September 14, 1964, on the charge of allowing the boom of a crawler-type crane to contact a high voltage line.

Fortunately, no one was injured.

Bringing any object within six feet of high voltage lines is a violation of both the California Penal Code and Electrical Safety Orders.

* "a plea by the defendant in a criminal prosecution that without admitting guilt subjects him to a judgment of conviction as in case of a plea of guilty but does not preclude him from denying the truth of the charges in a collateral proceeding."—*Webster*

State and Local Government

State and local government improved a little from 1960 to 1963, the injury rate declining from 33.2 to 32.2.

There was a fractional decline in the rate in the first half of 1964.

Trades and Services

In *trades and services*, there was little change in the injury rate in the 1960-1963 period.

However, there was a substantial rise—*more than 8%*—in the rate during the first half of 1964.

Safety Engineer's Alertness

Time and again, DIVISION OF INDUSTRIAL SAFETY personnel avert potential injuries and deaths in circumstances quite unrelated to their normal work, as a recent episode illustrates.

While returning to his headquarters, a DIVISION safety engineer noticed three small children playing in the street despite constant traffic.

On approaching their home to notify the mother of their peril, our engineer discovered another great danger to the children—green-colored grain strung along the driveway from the street to the garage.

Suspecting what the grain contained, he immediately called the Agricultural Commissioner, who at once investigated the situation.

The grain contained strychnine-treated rodent poison!

Available Reprints

The following articles, originally appearing in the CALIFORNIA SAFETY NEWS, are available in leaflet form:

Power Press Safety

Transportation of Workers—Current California Regulations

Lifting With Safety

Distribution of the lifting brochure is limited to 100 copies for any company or organization, and one copy for any individual.

Work Injury Publications Available On Request

The following are some recent DIVISION OF LABOR STATISTICS AND RESEARCH publications that are available on request to that Division, P.O. Box 965, San Francisco, California, 94101.

	Published
California Work Injuries	Annually
Work Injuries in California, Quarterly Statistical Summary	Quarterly
Work Injuries in Public Schools, California, 1963	May 1965
Work Injuries in California Agriculture, 1963	April 1965
Disabling Work Injuries to Employees of the State of California, Year Ended June 30, 1963	January 1965
Disabling Work Injuries to Employees of Lathing and Plastering Contractors, California, 1963	January 1965
Work Injury Trends in California (Prepared for Governor's Industrial Safety Conference)	January 1965
Farm Transportation Accidents, California, 1963	October 1964
Electrical Work Injuries in California Industries, Year Ended December 31, 1963 (Issued Jointly with Division of Industrial Safety)	September 1964

Some Section Pictures at the Conference



AGRICULTURE

Left to right: Milton O. Terry, Lane R. Potter, Jesse G. Frye, Cliff H. Jameson, Vincent W. Perry, John O. Barnes



MINERAL INDUSTRIES

Left to right: Kyle J. Lutz, Peter Nalle, Joseph M. Vierra, Walter E. Ousterman, Robert D. Bailly



TRADES AND SERVICES

Left to right, seated: Lester J. Coombes, Bertha Metro, Thomas L. McNair
Standing: Harold K. Goddard, Emlyn L. Cox



TRANSPORTATION, COMMUNICATIONS, AND UTILITIES

Left to right, seated: H. M. Clement, Mark J. O'Reilly, Linn Magoffin, Nate DiBiasi
Standing: Andrew T. Brozik, Gordon Brown



MANUFACTURING

Left to right, seated: Ray L. Bilskie, William S. Rhodes, Robert E. Mogel, J. W. Eickman
Standing: Frank B. Cole, John Chocholak, W. C. Leist, Henry A. Hartmann



CONSTRUCTION

Left to right, seated: Kenneth Johnson, Robert Sample, Thomas Prophet, S. A. Wattson, Paul Suter
Standing: Roger M. Brennan, Arthur T. Eisele, John N. Jepson, Charles S. Hidén



GOVERNMENTAL AGENCIES

Left to right: Melvin Nelson, Hufford Allen, Earl R. Simons, Ellis Larson, Harry Herod, Duane Hendrickson



The attractive exhibit was well patronized by the more than 1,200 persons who attended the Conference and availed themselves of publications of the DIVISION OF LABOR STATISTICS AND RESEARCH and the DIVISION OF INDUSTRIAL SAFETY.

"National Drivers' Test" on TV at 11 P.M. May 24th

Shell Oil Company is sponsoring what the National Safety Council describes as "the most massive one-shot safety communication effort of all time, and the most extensive attempt ever to educate by television."

It is "The National Drivers' Test" over the Columbia Broadcasting System (CBS), scheduled for Pacific time viewers at 11 p.m. May 24th.

In the comfort of their own homes, drivers will be able to grade themselves on driving judgment, knowledge, and perception, and compare their scores with 1,250 drivers who will take the test at six CBS stations.

Free test forms will be available after May 1st from Shell service stations and offices, local CBS outlets, and many local safety councils.

As the National Safety Council appropriately states:

"Beginning Memorial Day, this nation will enter the most hazardous driving period of a year that is already breaking all records for traffic fatalities. More Americans will drive to their deaths this summer than in any three-month period in the entire history of the organized safety movement, unless something extra is done."

"The National Drivers' Test" will, it is hoped, be that something extra.

Safety Shoes Pay Off

Recently, a 21-year-old hooker at a steel plant accidentally stepped on a live roller of a hot metal conveyor.

Fortunately for him, he was wearing safety shoes, so that he did not lose his toes.

The only damage was to the shoe: the leather was torn off the front of the shoe, and the safety toe cap was scratched.

The hooker was wearing safety shoes as a result of an accident prevention survey conducted at the plant some time ago by a safety engineer of the DIVISION OF INDUSTRIAL SAFETY. The engineer recommended a safety shoe program, and the plant superintendent immediately complied.

Safety shoes *do* pay off.

Offices of the Division of Industrial Safety

The following is a list of main and field offices of the DIS.

MAIN OFFICES

SAN FRANCISCO	455 Golden Gate Ave.	Underhill 1-8700
Los Angeles	3460 Wilshire Blvd.	Dunkirk 1-5695

OTHER OFFICES

Bakersfield	225 Chester Ave.	FA irview 4-6437
Chico	341 Broadway	FI reside 3-5182
Eureka	619 Second St.	HI llside 2-5748
Fresno	2550 Mariposa St.	AM herst 8-7151
Long Beach	230 East 4th St.	HE mlock 2-8443
Merced	550 W. 22nd St.	723-4561
Oakland	1111 Jackson St.	TE mplebar 4-3460
Redding	2115 Akard Ave.	CH estnut 1-5100
Sacramento	1107 Ninth St.	445-5818
Salinas	307 Soledad	424-4807
San Bernardino	478 West Base Line	884-6461
San Diego	1350 Front St.	232-4361
San Jose	888 North First St.	CY press 4-1525
Santa Ana	1619 W. 17th St.	547-1603
Santa Barbara	411 E. Canon Perdido	966-2918
Santa Rosa	306 Mendocino Ave.	542-8802
Stockton	807 N. San Joaquin St.	HO ward 6-3412
Ukiah	305 N. Main St.	HO mestead 2-8850
Ventura	3418 Loma Vista Road	642-9679



On the platform, left to right: Ernest B. Webb, B. A. Gritta, Geo. A. Sherman, Jack F. Hatton, Albert G. Boardman

Management's Responsibility for Safety...

(Some highlights of the address by DANIEL P. BRYANT, president of Bekins Van and Storage Company)

... I will discuss briefly with you three points:

First: Precisely what is the area of management responsibility and authority in the field of accident prevention?

Second: What can management do to improve its safety performance?

Third: What is the role of the union, and how, and under what conditions, can labor and management cooperate in achieving faster, greater progress?

Management's responsibility and authority.

My thesis on this point is as follows: In the area of "on-the-job accidents," *the responsibility of each management for an acceptable safety record simply cannot be shirked. The responsibility must be complete. It is ultimate and final. It cannot be shared.*

The reason for this proposition is that under our economic system of free competitive enterprise, the responsibility of management to the owners and shareholders requires that there be responsibility for performance in *every* aspect of the organization.

The making of a reasonable profit is a prime responsibility of management. The cost of accidents bears directly on the production of profits.

Supporting this proposition of management's final responsibility are the provisions of law, including safety regulations, and workmen's compensation laws which impose a legal responsibility on management that cannot be shared.

It is important that we accept this basic proposition, because it is fundamental to this discussion.

In my judgment, while management will readily agree to and give

lip service to this proposition, I do not believe there is as deep and literal acceptance of it as should exist.

I suggest this as the reason: Many of the basic causes of accidents are complex in their origins and seem outside the area where management has direct and effective control.

For example, I believe that the tensions, frustrations, and distractions of our times contribute to accident proneness. Ours is not a quiet, contemplative life which makes easy single-mindedness and concentration on the performance of the duties at hand.

This has been called "a time of explosion." The population is exploding; the pent-up frustrations of the peoples of the world are exploding; knowledge is exploding.

These explosions produce fast changes in the pace and manner of living.

Consider the emotional impact of such current words and phrases as the following: Polaris—Automation—Cybernetics—Rapid Transit—Mississippi—The Berkeley Riots—Viet Nam—The Extreme Left—The Extreme Right—Emerging Nations—Rising Nationalism—Atomic Attack.

These words and phrases carry the overtones of the deep tensions and frustrations that are part of today's life.

The fact is the home, the church, the school, the behavioral sciences, have not kept pace with the technological change; hence, *we live in a time of increased complexity*. We are having trouble coping with change from the standpoint of personal adjustment.

This factor—the characteristics of the time in which we live—has, and will in the future have, a very profound effect with respect to man's adaptation to his environment and



his ability to preserve himself from personal danger.

Perhaps this is the most relevant and current of all the questions before this Conference; namely, bringing our thinking up to date, in tune with the times and changing conditions. For management must accept man as he is, the times as they are, and so manage as to produce the demanded results.

What can management do to improve its safety performance?

Before any specific steps should be considered, management must put its own "attitude in order."

It must become committed and dedicated to the objective of a satisfactory safety record. It must determine to back up a safety program by action, laying the necessary funds on the line. It must be willing to spend in order to get.

Does management have a dedicated, committed attitude towards safety?

Some managements do. They have achieved amazing results. To generalize, I believe good progress has been made over the years. But from my observations I would say *many managements do not have sufficient commitment and dedication to the cause of safety.*

During the last few days in preparation for this address, I, and certain of my associates, surveyed a substantial number of companies by questioning members of their top management. We found a surprising lack of any knowledge both as to the cost of accidents and also as to the specific programs being carried out and their effectiveness.

A group of participating companies met a few days ago with their insurance carrier and the main point that came out of the discussion was this:

Management is not treating the problem of safety as a sufficiently vital management problem calling for more adequate investigation, analysis, and decision making, and a "do something approach."

Management is *not* always putting the necessary monies on the line together with adequate authority so that the job will be done.

A prerequisite to any improvement in its safety record is that management have its own "attitude in order."

Five Points

Now let's deal with specifics.

If management has put "its attitude in order," we should assume that certain results will occur. A program for proper selection, for adequate training, for adequate supervision and for the creation of adequate standards of performance will, of course, be established.

From the assumption that such a basic foundation has been laid, we then move to specific parts of a vital and effective safety program.

First, we must challenge whether we are making good on the foregoing assumptions. If there is any element of failure in these basic areas, corrective action must be taken.

Second, adequate procedures must be established for *analyzing performance* with a critical eye from the standpoint of the frequency, severity, and cost of accidents.

Third, we must establish *performance goals*, again with respect to frequency, severity, and cost of accidents—such goals to be realistic and attainable.

Fourth, there must be established a program for adequate motivation. Certain of our psychologists have recently taken the position that *fear* and *reward* are now known to be inadequate motivators, that motivation must come from within.

I believe that while ultimate motivation must come from within, and sometimes will wholly arise out of a particular individual's self-discipline, there must be outside or external motivators provided by management.

I will not elaborate on the importance of various kinds of recognition and awards as motivators. I believe they are essential, and there are a variety of ways of providing them with which you are familiar. . . .

I believe in recognition. It is a fundamental principal of management that if we are to ever hold a man accountable for producing a result or reaching a goal, there must be an advantage for him to succeed. This means that he must be rewarded.

The other side of the coin is that if there is failure to reach the desired objective or to meet the proper standard, there must follow, as the night the day, some penalty.

This requires that management be firm. It must be as willing to take disciplinary action for poor performance as it is generous in rewarding good performance.

In talking about rewards and penalties, we are talking about far more than contests, pins, cash awards, and other such devices. We are principally talking about the techniques of good management from first line supervision on up and concerning *day-to-day, hour-to-hour performance*.

This brings me to a fundamental concept of management expressed by

Larry Appley, President of the American Management Association, who spoke before a group of managers of our own company and made one statement which had a very profound effect on our management program. It was this:

"It is not what you *expect* that will produce results—it is what you *inspect*."

My experience in management over the years tells me that one of its greatest failures is the failure to properly inspect. Inspection is essential to the *awareness* of what is going on, and is a prerequisite to corrective action.

Morale will be higher when there is constant inspection by those who are dedicated to a high standard of performance and who will not tolerate that which is lackadaisical and easygoing. . . .

Management must manage.

A *fifth* point is that management should be humble as to its own knowledge.

It should be willing to draw on other agencies that can provide expert help and guidance; for example, our splendid DIVISION OF INDUSTRIAL SAFETY under Mr. Sherman; also the various insurance companies and associations, such as our own California Trucking Association, that have engineers and staff specialists capable of giving us advice and assistance.

As taxpayers, we help support state agencies; as members of associations, we pay our dues; and as insureds, we pay our premiums—but all too infrequently take advantage of the invaluable help that is available.

Finally, it must be a part of management's responsibility to provide the kind of atmosphere and climate

in which employees find meaning and satisfaction in their work experience.

These considerations have significant implications in every aspect of a company's program, including that of accident prevention.

What is the role of the union and how, and under what conditions, can labor and management cooperate in achieving greater progress in the field of accident prevention?

I would like to get away from euphemistic phrases such as "we must develop cooperative programs for labor and management," and get down to a closer analysis of specifically what labor's role can be and how it can work with management.

A preliminary and general observation is this:

Various unions throughout the country and officers of various unions differ dramatically as to their philosophy, their objectives, and their specific ways of functioning. Likewise, there are dramatic differences between industries, associations, and particular managements. Therefore, the kind of specific cooperative action that can work in one situation will not work in another situation.

There are certain unions and union officials that adhere to the original philosophy of Samuel Gompers, who expressed the view that the one objective of a union was "to get more."

Parenthetically, I recognize there was much more to Gompers' philosophy than this, but the single word "more" at one time seemed to characterize the historical struggle between labor and management—a management which tended to say "no more."

We recognize that over the years, both as to management and labor, there has developed greater statesmanship and an increasing sense of social responsibility.

In a recent address, Cardinal Cushing, Archbishop of Boston, made this statement:

"The acid test of the union movement, of labor-management, is not how well these promote the interest of a *class* or of a *partisan group*.

"The acid test is how well these promote the interests of the persons whom they exist to serve."

How well have unions, as well as management, promoted the interests of employees and union members, *as persons*, from the standpoint of *personal safety*?

There are three points that I would now make relating explicitly to the role of the union and its relationship to management:

First, I reiterate the principle, stated earlier in this address, that an adequate accident prevention program must be the full and complete responsibility of management.

Second, there is an important supportive role that the union, in following Cardinal Cushing's admonition, should play; namely, to communicate to management helpful information. Its suggestions, which grow out of experience and sensitivity to the viewpoint and the needs of union members, should have value to management.

Many of us have found that informal, non-bargaining sessions are mutually productive.

Third, there is a significant role for labor to play in supporting the legitimate prerogatives of the employer.

Specifically, it should support safety programs with their various incentives for good performance and the necessary disciplinary action that must be taken when performance is substandard. Management needs and appreciates this kind of backing.

A final comment on the role of the union and its relationship to management is this: The union's role, its objectives and goals in the face of automation and population explosion,

are changing. Management and its programs are likewise undergoing radical change.

We must be patient and above all practical and realistic as we adjust ourselves to new conditions and develop new and effective ways of working together.

As specific situations arise and with a general understanding of the problems that we mutually face, I believe new and improved techniques for working together will evolve.

I now come to my conclusion. . . .

In my remarks I have set down certain fundamental principles in which I believe, and I have also tried to candidly reveal areas where I feel management is not as effective as it should be. I frankly admit my own company's need for improvement in many of these areas.

I would hope you challenge what I have said. You are here today by reason of your background and your experience. You are uniquely equipped to bring your own knowledge up to date and to make it available for management's help and guidance. To be specific:

1. What do you feel are the *major weaknesses* in present management programs, and what do you suggest by way of specific answers?

2. What *changes* in safety programs have become necessary because of technological changes?

3. What new *motivational controls* are needed *tomorrow* that will take into account man's changing values?

The behavioral sciences are presenting new concepts concerning the changes in values resulting from urbanization, automation, the population explosion, and the growing percentage of the so-called white collar workers, to name but a few developments.

What can you tell us that will be helpful in improving our programs?

We need your help.

We will look forward to your findings and recommendations.

Yours for the Asking

To those interested in accident prevention in industry, a number of publications of the DIVISION OF INDUSTRIAL SAFETY will be of value.

They are yours for the asking—free!

For obvious reasons, we do not send more than three complimentary copies of any brochure to anyone outside the State.

An asterisk (*) means that the bulletin is available in Spanish also.

Bulletin 103, "Safe Handling of LP-Gas," is a revised brochure on the subject. It gives the use and characteristics of LP-Gas, and the rules and standards that govern safe handling.

Bulletin 104 (Rev.), "Ground It!" explains the necessity and wisdom of grounding electrical hand tools, and contains a sketch of proper connections for an electrical hand drill.

Bulletin 105 (Rev.), "Shoring of Trenches," reveals the heavy rate of fatalities in excavation work (compared with other construction) and gives safety measures that would eliminate cave-in accidents and injuries.

Bulletin 106, "Ladders on the Farm," gives ladder pointers which, if followed, will reduce the high rate of disabling injuries caused by poor farm ladders and improper use of sound ladders.

Bulletin 107, "The Ship-Shape Shop," shows how good housekeeping and maintenance in industry will save lives, save limbs, and save money.

Bulletin 108 (Rev.), "Taming the Circular Saw," deals with the most useful and at the same time the most dangerous of wood-working tools.

Bulletin 110, "Tips for Hotel Workers," gives valuable tips to maids, housemen, janitors, porters, elevator operators, kitchen personnel, mechanics, maintenance men, and others. It shows that hotel worker accidents are easily prevented if a few simple tips are followed.

Bulletin 111, "Farm Safety Check List," is a safety guide for everyone on the farm. Follow the rules and you won't be one of the thousands injured each year on California farms.

Bulletin 117, "Stop Grinding Out Injuries!" is about the abrasive wheel, one of the commonest and most useful tools in industry. It gives pointers which, if observed, will eliminate almost all grinding wheel injuries—of which over half are eye injuries.

Bulletin 120 (Rev.), "Safety Rules for Painters," tells you the four things that cause four out of five injuries to painters, and shows you how to prevent such injuries.

Bulletin 121 (Rev.), "Ladder Safety—Step by Step," shows that there is no bad luck about ladders when you observe three common-sense precautions.

Bulletin 122, "Handy Rules for Hand Tools," reminds us that little hand tools can cause great injuries, and describes the proper care and use of such tools as files, screwdrivers, wrenches, chisels, hammers, knives and handsaws.

Bulletin 124 (Rev.), "Safety Rules for Roofers," analyzes roofer injuries in a 12-month period and tells you how to prevent them.

Bulletin 125 (Rev.), "Are You Using Carbon Tet?" deals with a chemical that is causing more and more work injuries and deaths, and gives you four points to remember—to live.

* **Bulletin 127, "Look Out for Yourself If You Are Around Crop Spraying,"** is an illustrated booklet directed to the farm worker himself, and explains how pesticides can be used safely.

Bulletin 128, "If You Work in a Quarry," is for the quarry and open pit mine worker. It emphasizes that his complete safety on the job depends a great deal on his own efforts, and points out the things he should keep in mind.

Bulletin 133, "Analysis of California Logging and Sawmill Fatalities," contains a study of logging and sawmill deaths in California, and an injury-prevention program that if followed, should sharply reduce the number of injuries and deaths in what is one of the more hazardous industries.

Bulletin 135 (Rev.), "Check List of Requirements," is a guide for employers, safety engineers, and purchasing agents to show what they should check for before buying or renting equipment or placing contracts.

Bulletin 137, "Skin Trouble Is Plenty Trouble," deals with the most common disease you can get at work, and tells you how to avoid it.

Bulletin 138, "Supervision and Explosives Accidents," analyzes explosives injuries in California in a three-year period, and shows how much supervisors can do to prevent them.

Bulletin 140, "Keep AWAY from Power Lines!" is for any and all workers whose jobs may expose them to the hazards of overhead electric power lines. Heed the reminders—and live!

Bulletin 141 (Rev.), "Power Hand Saw Safety," gives common causes of power hand saw injuries; tells how to stop them; lists safe work practices, safe work conditions, and proper saw maintenance; and defines the safety responsibilities of employers and workers.

Bulletin 142, "Read and Understand the Label!" reminds us how vitally important it is to read and understand the labels of containers of hazardous chemicals and mixtures.

Bulletin 143, "Trade Association Safety Programs," shows the value of such programs and what they can do for you.

Bulletin 144, "The Know-How of Wire Rope Safety," gives information that the man on the job and his boss should know—how to select, install, inspect, and safely use wire rope.

Bulletin 146, "Safety In Pipeline Construction," shows how to plan and organize pipeline jobs which is most important, and the safe practices necessary to insure safety in various phases of the job.

Bulletin 147, "The Safe Use of Anhydrous Ammonia in Agriculture," discusses the three most important things which, if remembered, make anhydrous ammonia safe to use.

Bulletin 148, "The Safe Use of Aqua Ammonia in Agriculture," describes the precautions necessary for safe use of aqua ammonia.

Bulletin 149, "A Safety Program for the Small Contractor," explains why a safety program is a must for small contractors, and outlines the essentials of such a program.

Bulletin 150, "Electrical Safety and Swimming Pools," warns of the danger of electrocution from poorly maintained underwater pool lights, and describes the precautions that should be observed to make swimming pools safe electrically.

Bulletin 153, "Electrical Safety on the Farm," a colorfully illustrated brochure, points out the many electrical hazards encountered on the farm, and tells how they can be guarded against.

Bulletin 154, "The Tailgate Safety Meeting," gives pointers on an effective means of promoting on-the-job safety.

Pesticide Regulations No. 1 tells how to guard against hazards in the use of poisonous and toxic pesticides containing organic phosphates.

Guard Standards, No. 1, Materials and Construction, gives invaluable advice on constructing guards and selecting the right materials for them.

Guard Standards, No. 2, Stairways and Railings, gives requirements for stairways, railings, entrances to stairways, floor and wall openings.

Form 634, an 8½" x 11" placard. Safety Responsibilities—Employer and Employee—prescribed in Labor Code.

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Safety Orders Available at Documents Section

The following Safety Orders are available from Documents Section, P.O. Box 1612, Sacramento, California 95807.

Where Safety Orders have been revised (as almost all of them have been), the date is the date of the latest revision.

Money orders or checks made payable to the Documents Section must accompany all purchase orders. Don't send stamps.

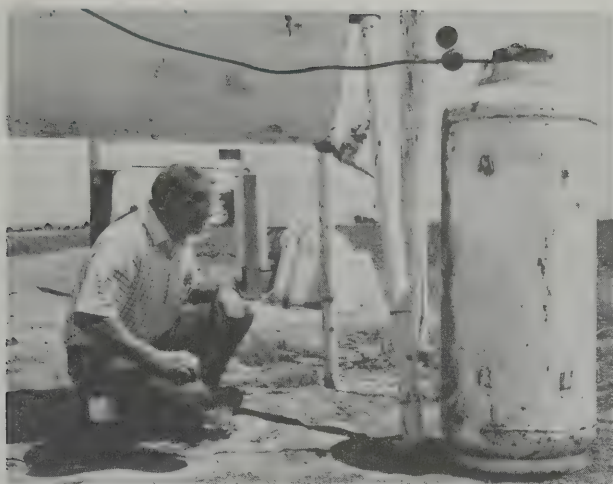
Documents Section gives a 10% discount on purchases of 50 or more copies of any one title.

Don't forget to add 4% sales tax if you live in California.

	Price	With sales tax
Aerial Passenger Tramway Safety Orders (1956).....	\$0.50	\$0.52
Boiler and Fired Pressure Vessel Safety Orders (1955).....	.50	.52
Compressed Air Safety Orders (1946).....	.50	.52
Construction Safety Orders (1957).....	1.00	1.04
Electrical Safety Orders (1962).....	1.50	1.56
Elevator Safety Orders (1954).....	1.00	1.04
General Industry Safety Orders (1963).....	1.00	1.04
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Mine Safety Orders (1958).....	.75	.78
Petroleum Safety Orders—Drilling and Production (1959).....	1.00	1.04
Petroleum Safety Orders—Refining, Transportation and Handling (1951).....	.75	.78
Pneumatic Explosives Loading Safety Orders (1944), Quarry and Open Pit Mine Safety Orders (1953).....	.75	.78
Ship and Boat Building Safety Orders (1961).....	.50	.52
Tunnel Safety Orders (1962).....	.75	.78
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Window Cleaning Safety Orders (1952).....	.50	.52



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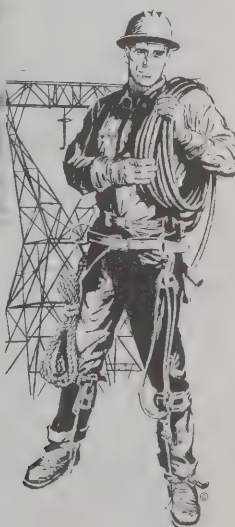
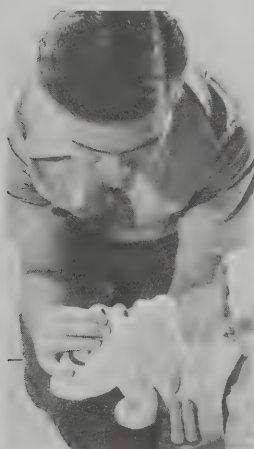


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CALIFORNIA

SAFETY

NEWS



OCTOBER, 1969



Chiefly speaking

Management and labor over the years have come to accept and support the vital programs of the State Division of Industrial Safety.

The Division has won support by doing its basic job well. But the Division cannot do the kind of safety job that must be done in California by performing only its basic assignments.

The basic job, of course, is important. We in the Division must promulgate reasonable safety orders so there can be rules under which all work places should operate to assure employee safety. Then we must seek compliance with the safety orders, impartially, with good judgment, and without nit-picking.

Most safety orders, however, apply to physical things like machine guarding, hazards on stairways, ladders, elevated work platforms, and scaffolds, or handling hazardous materials, or working in hazardous areas.

Our state safety engineers need to look beyond these mechanical and environmental hazards and observe the big picture of accident prevention.

One real problem in efforts to prevent industrial injuries is people, their attitudes and habits. The safety engineers must study how the workers are performing on the job, how particular jobs are done, and determine if that way is safe. Workers quite often cause accidents because they make mistakes or do things the wrong way.

Our safety engineers can learn much about attitudes toward safety through foremen and supervisors. In visiting workplaces, the engineers should discuss safety problems with these key men, inquire about their safety records, the kinds of accidents and injuries they are having and their causes. Such information can aid our engineers in advising employers who want to develop an effective safety program or who may wish to improve programs now operating.

A good safety program is made up of a lot of things involving machines, work environment, and workers themselves. The maximum safety effort, consequently, would involve all industry—management and labor—in working with all of the pieces that add up to effective accident prevention.

I think we in government should also make a similar maximum effort, if it can lead to elimination of injuries to California workers. That goal, after all, is the only reason the State Division of Industrial Safety is in business.

Jack F. Hatton

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CALIFORNIA SAFETY NEWS

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RESEARCH AND EDUCATION

J. Robert Signer, Supervising Engineer

Gene Cresci, Editor

Marjolaine O'Neill, Graphic Artist

Vol. 53, No. 3 October 1969

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- 10 First Aid care . . . second in a series—Artificial respiration
- 13 Automated data storage, 'fall-out,' analysis—Key to safety management systems

Peter Weinberger, Director of the Department of Industrial Relations since June 1, 1969, succumbed unexpectedly to an apparent heart attack September 10. "We are saddened by this sudden loss," said Jack F. Hatton, Chief of the Division of Industrial Safety, "and I know we shall miss his advice and counsel, and his particularly sympathetic response to the problems and goals of industrial safety."



Warning to Farmers

Pressure systems can be dangerous

Joseph Olesiak, Safety Engineer
Pressure Vessel Section, Division of Industrial Safety

A common misconception of pressure leads to many accidents, some of which cause injury and death. The term, so many pounds pressure, is misunderstood as equivalent to weight. The correct unit of measurement is pounds per square inch, and the total energy involved is pressure times the total area in inches. Fifteen pounds per square inch pressure acting on a 48" diameter tank 8' long is $15 (48 \times 3.1416 \times 8 \times 12 + 2 \times 24 \times 24 \times 3.1416) =$ over 270,000 lbs. or 135 tons of total force.

A consequence of this misunderstanding is the hazardous misuse of pressure. For example, air or gas pressure is frequently used in the agricultural and construction industries to transfer or spray liquids quickly. This is safe if the containers are properly designed to withstand the pressure applied, and if the vessels are equipped with safety relief valves to limit the pressure that can be applied. Too often, however, air, NH_3 , or propane is used to pressurize oil drums, plastic chemical containers, glass bottles, or old gasoline truck tanks with "just a few pounds pressure." If this is done often enough or with enough pressure, the tank will leak or blow up. People who are not familiar with pressure think that if it holds once, it will hold forever. This is not true. Each succeeding pressurization is more dangerous (unless, of course, the vessel is properly designed).

These "leg tanks" are commonly used on California farms to dispense fertilizer chemicals, and offer no explosion hazard unless pressurized. They are not built to any pressure vessel standard but only for gravity flow of chemicals. Inspecting the tanks are two safety engineers of the State Division of Industrial Safety, Bob Johnson of the pressure vessel section (left) and Bill Wilson of the industrial section.

Section 550(c) of the Unfired Pressure Vessel Safety Orders explicitly forbids such misuse of pressure:

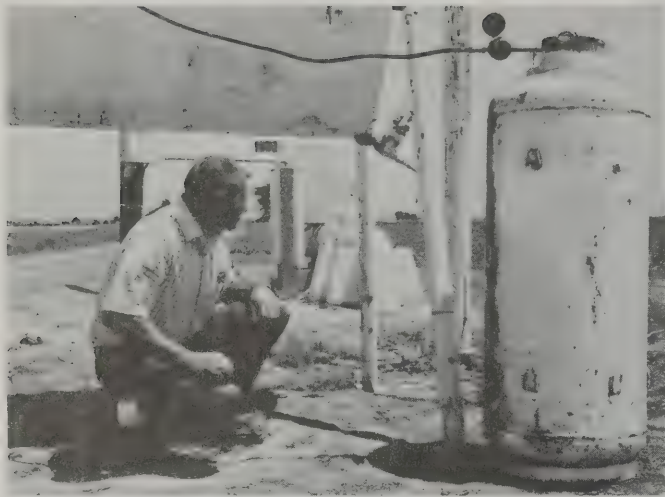
"Compressed gases shall not be used to elevate or otherwise transfer any substance from one container to another unless the containers are designed to withstand the maximum possible pressure that may be applied with a factor of safety of at least four (4)."

Other State safety orders cover design standards for pressure vessels and requirements for controls and safety valves.

Although the problem is not a new one, the Pressure Vessel Section of the Division of Industrial Safety recently learned that hundreds of tanks in agricultural areas were being used in violation of State safety orders. In some areas the tanks are owned by farm supply companies that specialize in selling all types of chemicals to the farming industry.

The companies employ their tanks for straight air storage in conjunction with other tanks holding a liquid fertilizer—the compressed air from one tank is used to force the fertilizer from the second unit.

There are two basic types of units: One is a two-wheel trailer with a 48" x 8' long liquid fertilizer tank mounted lengthwise on the trailer. Either a single vertical tank or two vertical tanks are strapped to the front end of



This ICC cylinder is being improperly used for compressed air service. Such cylinders are designed only as containers of non-corrosive LP gas. Bob Johnson of the pressure vessel section, State Division of Industrial Safety, here surveys a pressurized cylinder and "leg tank" that is feeding agricultural chemicals into the irrigation line in the center, background.

this fertilizer tank, and the vertical tanks are charged with compressed air, at about 125 psi, from the company's own compressed air system. (None of these tanks have stampings to indicate they were designed for pressure service.) The large horizontal tank is filled with a liquid fertilizer solution. When set in the field, air pressure is applied to the liquid fertilizer, at 10 psi to 18 psi, from the vertical tanks through a regulator valve. Liquid fertilizer is metered into the irrigation water by an adjustable valve at the bottom of the tank. Sufficient air storage is carried to discharge one tank of liquid fertilizer. Both tanks are recharged at the plant for the next operation.

The second basic type called a "leg" tank has about a 48" diameter and 8' or 12' length. These tanks have four legs which are removed or retracted when transported to and from the field. The legs fit into two welded attachments on each head, and when installed the bottom of the tank stands about five feet above ground level. Either one or two air tanks is set beside this unit, and the

procedure employed is the same as for ejecting the liquid fertilizer.

The air tanks found in use were ICC cylinders of various makes but mostly of the 4B240 classification. On the portable units there were also quite a few surplus API-ASME Code butane storage tanks that had not been properly converted for air service.

Using such tanks for compressed air storage is normally not permitted, and permits to operate air tanks must be obtained, in most cases, from the State Division of Industrial Safety.

The fertilizer tanks that are to be pressurized in service must be constructed in accordance with the ASME Code or to good engineering practice with a factor of safety of at least four. Such tanks must also be equipped with controls, including safety valves, to permit safe operation.

While most of the fertilizer application may be finished for this year, we hope that this information will prevent misuse of pressure vessels in future seasons.

Pressure Systems for Farm Use

What can do the job safely?

**R. W. Brazelton, Extension Agricultural Engineer
University of California at Davis**

The agricultural public and researchers should be alerted to the extreme danger in using compressed gas as a propulsion force in farm production and research. Certain uses of compressed gas for propulsion may also violate California's Industrial Safety Orders.

One type of pressurization is the common, small, portable propane or butane tank with regulator like those carried by trailers and campers. These gases have an excellent liquid-to-gas volume conversion, are easily procured in most localities, and are conveniently stored. Many users, consequently, consider these small butane tanks working through a regulator to be ideal for pressurizing liquid fertilizer concentrate. The concentrate under pressure can be forced into the standpipe of a field irrigation system with need for only occasional service

and replacement. Researchers might well use the same technique to apply pressurized sprays to test plots.

No readily available material performs at comparable cost and with comparable ease. But the practice is DANGEROUS! Propane and butane are explosive. As the fertilizer or insecticide in these tanks is used up, propane gas fills the space and the tank becomes a potential bomb. Such danger faces a worker who now opens the tank to refill it while smoking a cigarette or while using a steel wrench that could strike a spark. Additional danger can come from possible sparks from a jeep or truck ignition or from truck exhaust.

The State Division of Industrial Safety has recognized these dangers, and in the "Unfired Pressure Vessel Safety Orders," Title 8, paragraph 474 (b), has forbidden such use. Other paragraphs in the Orders call attention to additional hazards of pressurized systems.

What are the alternatives? Well, there are several.



Surplus marine floats or buoys are another example of the extreme hazards facing anyone who pressurizes equipment not designed for such use. Two have ruptured in recent months, and the danger of rupture is always present when the steel spheres are pressurized.

Shown here is a float that ruptured. It was being used in Kern County to apply agricultural chemicals. The float, filled with fertilizer, was hooked up to an ICC cylinder, and nitrogen gas in the cylinder was used to push the fertilizer out of the float through connecting lines and into irrigation water.

Paul Carosella, senior safety engineer in the pressure vessel section of the State Division of Industrial Safety, Bakersfield (shown at left), reported the float ruptured under pressure. The sphere, which was not constructed for internal pressure, was 3/16 of an inch thick and with a diameter of 58 inches. The explosion luckily caused no injuries.

Some are nearly as easy to apply, but are even more dangerous. Freon seems a ready substitute, with many of the advantages of propane or butane, though it is relatively expensive and difficult to procure.

How about compressed air? Use of large amounts of compressed air over a long time requires high pressure in relatively large cylinders, with adequate regulators and other safeguards, as described in the State Safety Orders. Its oxygen content provides a potential combustion, and it is not too easy to procure high pressure air in cylinders. Where practical, an air compressor system may be a better answer than the high pressure cylinder.

How about oxygen in bottles that are so easy to come by at the local welding shop? They are too dangerous.

Oxygen could cause ignition if accidentally mixed with grease, oil, or other foreign chemical matter.

What, then, can do the job safely? Two possibilities are carbon dioxide (for example, in containers used by beverage distributors to carbonate soft drinks and draft beer) and nitrogen (becoming more readily available in both liquid and gaseous forms). Of these, the liquid nitrogen at about 307° below zero is primarily a laboratory agent, but both CO₂ and nitrogen can be easily obtained in high pressure cylinders. They are recommended **PROVIDING** their potential dangers are recognized. CO₂ can cause skin freezing as well as displace oxygen in a confined area causing asphyxiation or carbon dioxide poisoning. When used in tanks at high pressure, another potential danger is accidentally dropping or breaking the valve or regulator on the tank converting it into a rocket. The regulator must be of high quality and reliable, and the associated system must conform with State Safety Orders to prevent low pressure tank ruptures or line breaks elsewhere in the system.

There is one more precaution, this one involving color coding. In America green may mean "Go" at the street corner, but on a high pressure bottle it means "STOP—and think." Oxygen containers are colored green to warn of **DANGER** from contact with oil, grease, or other foreign matter.

There is no consistent color code for identifying other gas containers, so caution should be used with all gases.

Well, there we have it. Let's look at the choices:

Propane or butane—No soap—they are out because of potentially severe injury and are illegal for use as field sprayer or fertilizer injector.

Oxygen—Worse! In the certain death category. Never use!

Compressed air—Generally acceptable, but observe standard precautions for high pressure hazards. Approved scuba diver tanks or other tanks should be manufactured to industrial safety standards. There is some potential fire hazard due to oxygen content. Compressed air is readily available in moderate pressures and potentially usable in automatic remote systems with automatic compressor equipment. Permits to operate compressed air tanks are generally required by the State Division of Industrial Safety.

Nitrogen—Inert, non-explosive and generally ideal. It is subject to usual high pressure gas precautions. Nitrogen, generally available and becoming more so, is probably the best for use as field sprayer or fertilizer injector.

Carbon dioxide (CO₂)—Inert, non-explosive, and generally ideal. Watch the frost hazard. Subject to usual high pressure gas precautions. CO₂ is generally available and good for these field uses.

If all else fails, and pressure simply isn't a practical answer for that sprayer or injector, there is always the pump. A multitude of combinations exist for all volume outputs, degrees of precision in volume flow, power requirements, and cost ranges. Always remember this, however. No tank should be pressurized from any cylinder unless it is stamped with a maximum allowable pressure, and unless it is protected by a safety valve set at or below the stamped pressure.

Stauffer's golden decade of safety

"This plant started operation January 27, 1958. We have had no lost time accidents ever. We plan not to have a lost time accident."

"G H T F M" (God Help the First Man)

That sign on a wall at Stauffer Chemical Company's phosphate plant in north Richmond proudly tells a unique safety story—and rightly so, for the record grew over more than a decade of operating in one of America's most hazardous industries.

The plant through July, 1969 amassed 4204 days and 668,602 manhours of exposure without a single disabling injury. About 30 workers in the standard small chemical plant on Maas Avenue, Richmond, produce phosphoric acid and chlorinated tri-sodium phosphate for industry.

Describing the record is easier than explaining it, but Stauffer's West Coast safety director, Ed Valentino, credits the men themselves for the plant's safety record. "Those people out there have done a helluva job. You can condition people and get them used to working under dangerous conditions. But out at the Maas Avenue plant, the men are used to working in a neat and orderly place, and they keep it that way. Each employee, in other words, is a safety man—working safely because he wants to and not because he is forced to."

Stauffer has a broad safety program, of course, to protect its men exposed to such hazardous work. Hard hats, safety shoes, and safety glasses are mandatory. Foremen post written instructions for each job, including special precautions for hazardous procedures. The company also sponsors monthly drawings for safety awards, usually a merchandise prize worth about \$25, and a dinner once a year around Christmas time.

Like all Stauffer plants, north Richmond holds a once-a-week safety meeting, and plant supervisor Lloyd Heise sees these meetings as a good way to keep the safety story before the men. For the meetings that may last from ten minutes to an hour, the company supplies informational material. Stauffer also distributes to every plant the individual monthly safety reports from all its facilities around the country. They carry the statistics of safety records and detailed accounts of accidents and disabling injuries. Ed Valentino explained that all accidents must be reported to the New York company headquarters within 48 hours, and this information is then circulated to all Stauffer plants throughout the country. There are also cross-plant checks made by safety inspection teams from other plants. "This gives everybody a chance to see how others are doing the safety job," Valentino said, "and provides another pair of eyes that can see things that the men working on the spot are too familiar with and may not see."

It's the workers themselves, though, that make any company safety program work, according to Bob Allison, Stauffer's plant manager of the industrial chemicals division in Richmond. "The best kind of safety program can pay off when each worker feels he is his brother's keeper." There is a continuity in the operation at the Richmond plant, Bob said, so every man knows what he has to do and there are certain procedures to be accomplished. So the responsibility for safety spreads broadly

among each plant manager, foreman, and worker.

The older workers help break in new help, and the first thing they share is the plant's safety record. "I saw the awards when I first came to work here," said John McGill, an acid operator for nine years, "and I was impressed. I knew it was up to me to help keep the record going."

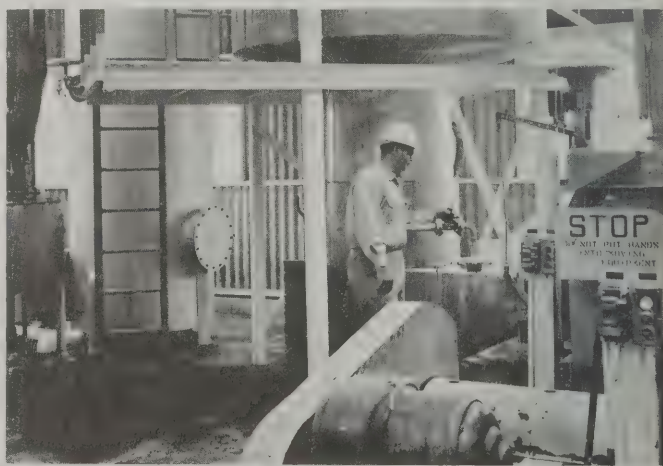
And for every worker during his first day on the job at Stauffer's Maas Avenue plant, the older men make it plain that safety is important. Newcomers see the impressive wall covered with safety plaques and certificates from the Manufacturing Chemists Association, the National Safety Council, and the Stauffer headquarters. They talk with the older workers and are counseled to ask questions, be on guard against hazards, and report them.

"A new man can't help but be impressed with the attitudes toward safety, and with the kind of neatness and orderliness they see all around them. That's part of their success. The men see it and know that safety is important," Valentino observed.

The men at north Richmond have their share of cut fingers and stubbed toes, and Lloyd Heise makes a point of seeing that any injury is cared for as soon as possible. "We also talk with the injured man and find out how the accident happened—on near misses we investigate immediately and correct the fault," Heise said.

Plant appearance, employee attitudes, official company encouragement, and, of course, the pride in a unique record—these are the elements that help explain how the effective program moves its record-breaking way. "Stauffer is vitally interested in safety from top management on down," the company president once said, and they believe and practice that policy at Maas Avenue.

They also believe in the truth of "G H T F M"—God Help the First Man. Whoever he is, he hasn't shown up yet, and everybody there keeps working at safety to make sure he never does.



Cleanliness and orderliness are important in Stauffer's safety program, so important that employees there probably would object to any other kind of working environment. Note the warning sign and the operator's hard hat.

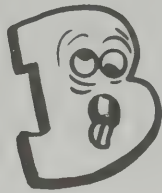
A mechanic and an acid plant operator hook up a phosphorous tank car at Stauffer Chemical Company's north Richmond plant. These men illustrate some of the practical reasons why the plant has never had a lost-time injury in more than a decade of operation. Note the face shields, hard hats, and protective gloves.



THE ABCs



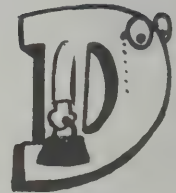
...is for
ACCIDENT



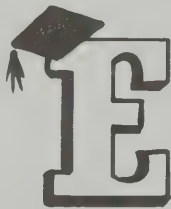
...is for the
BOO BOO
that caused it.



...is for the
CARE
that should
have been
taken.



...is for the
DOCTOR
who came
after it.



...is for the
EDUCATION
that could have
prevented it.



...is for being
FAMILIAR
with equipment
and tools (it's a
good way to prevent
accidents).



...is for
GUARD
against
accidents.



...is for safety
HAT
and learning
to wear one.



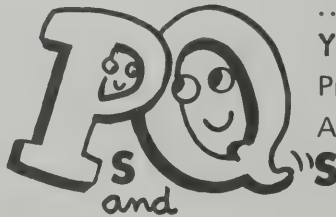
...is for
INTEREST
in learning
safety rules.



...is for
JUDGEMENT
(good judgement
must be learned).



....is for the
"OTHER GUY"
the accident
always
happens to.



...Watch
Yours to
Prevent
Accidents



...is for
READ
safety signs
and literature.



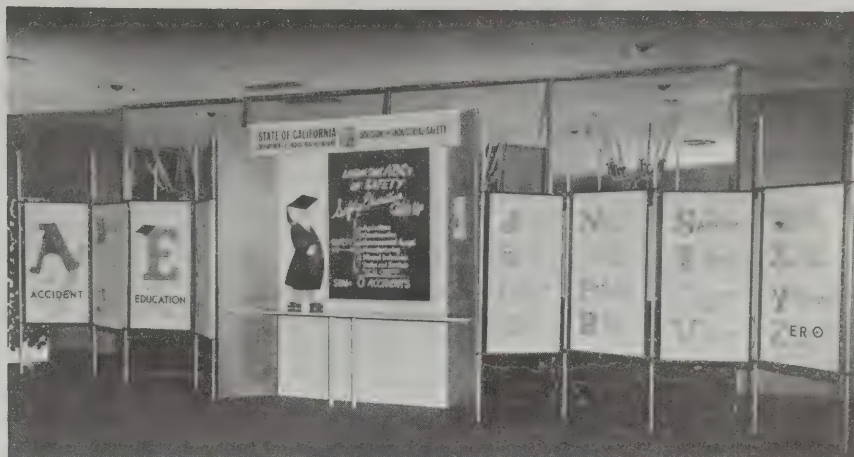
...is for
VISUAL AIDS
to safety.



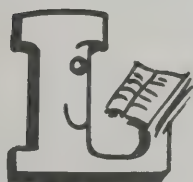
...is for
WRITE +
for safety
information if
you don't have it.

OF SAFETY

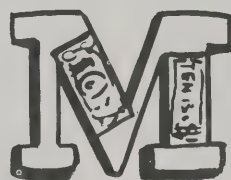
Safety education keynoted the theme of the 1969 Governor's Industrial Safety Conference, and was visually presented (right) at the Ambassador Hotel, Los Angeles, during the conference. Marjolaine O'Neill, graphic artist of the California Department of Industrial Relations, designed the exhibit and adapted its message for presentation on these pages as "The ABCs of Safety."



is for
KNOWLEDGE
through
education.



...is for
LITERATURE
on safety
to acquire
knowledge.



...is for the
MONEY
saved through
accident
prevention.



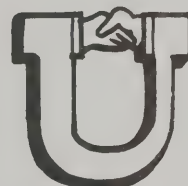
...is for
NO
more
accidents!



...is for
SAFETY



...is for
TRAINING
(the well trained
employee is a
safe worker).



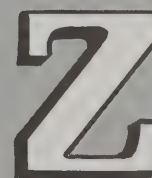
...is for
UNDERSTANDING
of safety by
employer and
employee.



...marks the spot
where accidents
don't happen
when you know the
Safety Alphabet.



...**YOU**
are the best one to
prevent accidents.



...let
ERO
be your
accident goal!

Artificial respiration

**E. F. Allen, Safety Representative
Health and Safety Activity
Bureau of Mines
U.S. Department of the Interior**

Oxygen is essential to human life, and all living tissue depends for life on the oxygen carried by the blood. Because oxygen enters the body by breathing, any interference with or stoppage of breathing produces oxygen want or asphyxiation throughout the entire body. Breathing is an act over which we exert little control. It occurs in an adult from 12 to 15 times a minute and in a child about 20 times a minute when at rest, but the rate may be increased by labor, exercise, and other causes. Breathing consists of two separate acts: Inspiration, an enlargement of the chest cavity with a lowering of the pressure within the cavity, when air is drawn into the lungs; and expiration, a diminution of the chest cavity and increasing of the pressure within the cavity, when air is forced out of the lungs.

Air, which contains oxygen, nitrogen, and slight percentages of other gases, enters the lungs through the nose or mouth, throat, windpipe, and bronchial tubes. At the top of the windpipe is a flap, medically termed the epiglottis, that closes over the windpipe during swallowing to direct the food or liquid into the stomach. The tongue of an unconscious person, especially if he is lying on his back, may close the epiglottis over the windpipe and partly or completely block the flow of air into the lungs.

First-aiders should always determine that the tongue is pulled forward when a person is unconscious, when a person is not breathing, or when a person's breathing is distressed. This may be accomplished by using the thumb and finger, preferably aided by a dry cloth or piece of paper, or by using forceps. After the tongue is pulled forward, it may be necessary to tie it in this position.

Because first-aiders have no means of influencing muscular action in an unconscious person to produce normal breathing, they must rely on some method of artificial respiration to imitate breathing in those persons whose respiration has stopped or become very irregular or feeble. The most frequent conditions under which artificial respiration is required are electric shock, gas poisoning, drowning, and suffocation from various causes.

Causes of Asphyxiation and Initial First Aid Measures

Electricity causes shock by paralyzing the nerve centers which control breathing or by stopping the regular beat of the heart. Every second of delay in removing a person from contact with an electric current lessens the chance of resuscitating him. First-aiders should act quickly, but always in such a way that they are protected from contact with the electric circuit. The current should be turned off if a switch is near. If an axe

is readily available, it can be used to cut the conductor, but the handle should be dry or it should be wrapped with a dry coat or other dry nonconducting material. A first-aiders can stand on a dry board or thick dry paper, wrap one hand with a dry coat, cap, or other nonconducting material, and with the other hand behind his back drag the victim from contact.

Several noxious and toxic gases are encountered in industry, and a few are encountered in everyday life. Carbon monoxide, a product of incomplete combustion, is one of the more prevalent ones. Since it is odorless, tasteless, and colorless, we rarely know of its presence. Regardless of the gas in which the person was overcome, first-aiders should ventilate the area quickly, perhaps by opening doors and windows, or they may be able to hold their breath for a short rescue, enter the area, and drag the victim to fresh air.

Drowning is a simple form of asphyxia, as the supply of oxygen is cut off completely under water. However, this does not mean an immediate lack of oxygen, because there is a small reserve left in the lungs and blood that should maintain life for a short time. A victim should be removed from the water as quickly as possible, an air passage should be opened to his lungs, and artificial respiration should be started immediately. Expulsion of air by artificial respiration tends to remove water that may be in the lungs, and care should be taken that the nose and mouth are low and unobstructed to prevent the water from reentering the air passage.

Suffocation is usually caused by something that lodges in the windpipe, by material covering the nose and mouth, by inhalation of harmful gases, or by being buried in fine material. Victims become unconscious, their lips and ear lobes turn blue, their pulse becomes rapid and weak, their breathing stops, and the pupils of their eyes become enlarged. If the windpipe is blocked, striking the victim a series of sharp blows between the shoulder blades with his head low may dislodge the obstruction and cause normal breathing to start. The object sometimes may be removed by inserting one's finger into the victim's throat and withdrawing the obstruction. Care must be taken not to force the object deeper into the windpipe. If these efforts are not immediately successful, artificial respiration should be started as soon as rescue has been completed.

Giving Artificial Respiration

There are several methods of giving artificial respiration, all effective, but the amount of air forced into the lungs varies with each method. Some methods cause exhalation as well as inhalation. A particular method may have to be selected because of the position or injuries of the victim, and some methods are more tiring to the first-aiders. The Holger-Nielsen (back-pressure arm-lift), the Schafer (prone-pressure), the Silvester (chest-pressure arm-pull), and the mouth-to-mouth or mouth-to-nose are the methods most commonly used. The application of the first and last of these methods is discussed in this article. To become proficient in administering artificial respiration, however, actual practice is essential—in a first aid class, at home, on the job, or elsewhere. The first considerations are time and the proper preparation of the victim. Regardless of the method used, if rescuers do not start artificial respiration at once or fail to maintain an open air passage, the victim will probably die.



Step 1



Step 2

Back-Pressure Arm-Lift Method. The back-pressure arm-lift method should be used where the victim does not have interfering injuries because the volume of air exchanged is greater than in the other manual methods. The victim should be placed face down, with his elbows bent and his hands placed one upon the other under his head. The first-aiders should kneel, with one knee on either side and just above the head of the victim. He should place his hands flat on the victim's back just below the shoulder blades, with the tips of the thumbs just touching and the fingers spread downward and outward. He should rock forward with his elbows straight until his arms are approximately vertical, allowing the weight of the upper part of his body to exert slow, steady, even pressure downward upon his hands and the victim's back. This will force air out of the lungs.

The pressure should be released, taking care to avoid a final thrust, and the operator should rock back slowly. The operator should then place his hands upon the victim's arms just below the elbows and draw the elbows toward him, applying just enough lift and pull to feel resistance and tension in the victim's shoulders. Again, the operator's elbows should be kept straight. The cycle is completed by lowering the victim's elbows gently to the ground. The cycle should be repeated 12 times a minute at a steady, uniform rate of compression and expansion, resulting in a complete respiration every 5 seconds.



Step 3



Step 1

Mouth-to-Mouth Method. The mouth-to-mouth or mouth-to-nose technique of artificial respiration is a practical method for emergency ventilation of a person of any age who is not breathing. A rate of about 12 breaths per minute is recommended for adults. Relatively shallow breaths should be given to children at a rate of about 20 per minute. Only shallow puffs should be given to infants.

The victim should be positioned on his back, with head low if possible, and his head should be tilted back to straighten the windpipe and to remove the tongue from the epiglottis. It may be necessary to grasp and then raise his lower jaw until it juts out. The victim's nostrils will have to be pinched closed or his mouth sealed when the first-aiders mouth cannot cover both the mouth and nose of the victim simultaneously. The operator should place his mouth over the victim's mouth (or nose), making a tight seal. He should then blow into the victim with a smooth, steady action until he sees the chest start to rise. He should then remove his mouth, causing the victim's lungs to deflate and expel the air. The cycle is then repeated. If the victim's stomach fills with air, the operator should apply sufficient pressure with his hand to force it out. Efforts to restore natural breathing should be continued. If a foreign body is blocking the windpipe so that air cannot be blown into the victim's lungs, he should be placed on his side and given a sharp blow between his shoulder blades to jar the obstructing object or material free. It should then be removed from his mouth.



Step 2



Step 3

Regardless of the method used, the preservation of an open airway is essential. This can best be done by assuring continued extension of the head and neck, while maintaining forward displacement of the lower jaw. The lives of some asphyxiated victims can be saved simply by establishing an open airway, permitting spontaneous breathing.

Artificial respiration should not be stopped until normal breathing is resumed, a physician pronounces death, or rigor mortis occurs. Persons have been resuscitated after as long as 72 hours of artificial respiration.

To be continued

Next Issue: Control of Bleeding, Third of a Series

Key to safety management systems

W. C. Pope, P. E.
Chief, Division of Safety Management,
U. S. Department of the Interior

Managers of safety programs today are under pressure to rethink the way to reduce accidents. The net result could more clearly delineate the "engineering" and "management" approaches to techniques of loss prevention. Most of this pressure for change results from a growing dissatisfaction among top safety specialists. The old ways of removing performance errors and condition defects are not good enough today. It is time to break away from tradition.

Early Rumbling of Things to Come

Personal dissatisfaction with the "old way" was brought to a head quickly by my appointment as Department Safety Officer for the U. S. Department of the Interior in 1955. The job of constructing and directing programs to reduce accidents among 50,000 employees, in 15 bureaus, spread out all over the United States, seemed astronomical . . . especially since the Department had just been challenged by Senator Hubert H. Humphrey to get in line with the lesser accident experiences of other Federal Departments and with industry in general.

"I asked the Acting Secretary of the Interior," Senator Humphrey said, "to study the high frequency rates of his various services like the Office of Territories, 37.8; National Park Service, 14.9; and the Bureau of Reclamation, 13.9. I asked the Acting Secretary to compare these figures with those of private industry or with the Navy yards. After his study, I sincerely hope he will take the steps to improve this deplorable safety performance of his Department during his predecessor's tenure." (Congressional Record, March 23, 1955, p. 4804)

A total accident prevention effort was organized under the Office of the Assistant Secretary for Administration. Change was introduced so that now, the "old way" of accident prevention is hardly recognizable. Attesting to our success is the fact that in the past decade the rate of disabling work injuries among employees, now averaging about 71,000 people in some two dozen bureaus and offices has been cut in half. For example, the 1967 rate of disabling injuries in the Office of Territories was zero; the National Park Service, 9.4; and the Bureau of Reclamation, 2.4.

Safety Management vs. Safety Engineering

Interior has developed new concepts of safety management based on theory and management of systems and

. . . all "systems" do not have to be "GO" in this breakaway from traditional safety programs . . .

utilizing some of the principles of behavioral science. It has been an evolutionary experience—and we are not through.

As a licensed professional engineer and as a member of the American Society of Safety Engineers since 1946, for years I was quite comfortable with the "educate, engineer, and enforce" concepts of accident prevention. That is, until I had to stop acting as a safety engineer/teacher/inspector and begin operating as a safety manager.

As a manager, I had to start thinking about getting the job done through other people—not doing it myself. And it came as no surprise that, as an engineer, I found myself not really accepted as a member of the management "team." To join the team, I had to change—understand, be, and act like a manager.

Faced with the need for administrative support, I examined the basic concepts of management itself in relation to safety. Management, I learned is not vested in a single person. It is a complex of people in a hierarchy arrangement. I learned also from the Department of the Army's Conference for Personnel Management Executives in 1964 that a supervisor is to be considered as much a manager as is the highest executive in the organization (a most important factor in the Safety Management Information System—SMIS concept). Here also I was told about principles of human behavior and motivation in which people tend to support ideas in which they are emotionally involved; that security or safety needs rank high in the basic needs of man; and that employees have higher work satisfaction when their supervisors take considerable interest in their ideas and suggestions. These and

The author, W. C. Pope, first presented Systems Safety Management in an address before a chapter of the Aerospace Systems Safety Society, meeting last year at Silver Spring, Maryland. Mr. Pope is a member of the Board of Directors of the National Safety Management Society, Washington, D.C., as well as one of the top safety men in the Federal Government.

other formative ideas played a large part in developing the management approach to safety.

In August 1965, I proposed progressive new approaches to Safety Programs Management. Included in them was a foundation for systems safety management which made the following observations:

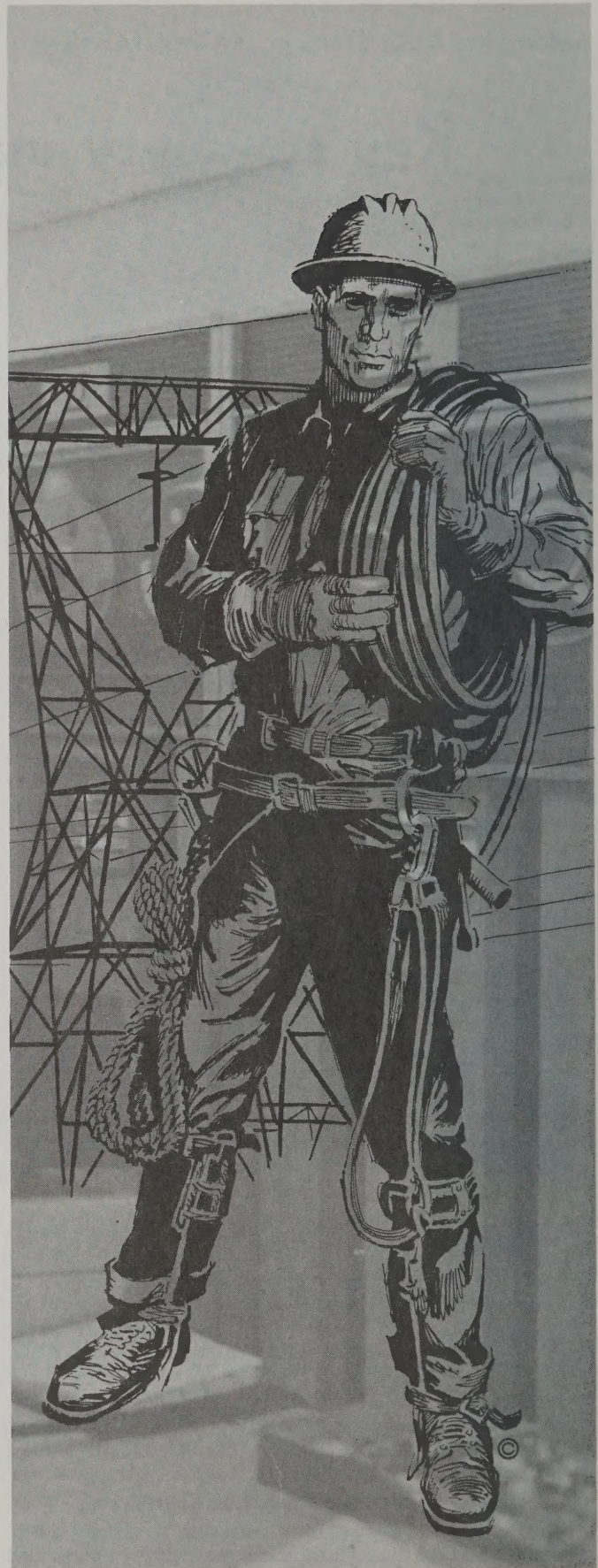
1. The word "safety" is sentimental in nature and without a common meaning to most persons. People managing people and property tend to depreciate the basic objectives of the safety function because they do not understand them. Managers tend to shy away from an abstraction couched in unfamiliar terms.
2. Safety administrators must understand organization and processes of management to bring about the quality of interest and support required from other functional members of the management "team" to support the safety activity.
3. Interfunctional interest begins with the identification of common program concerns. Interfunctional support is fostered by a cooperative effort toward obtaining common program objectives.
4. Causal analysis of accidents will be recognized as an important tool of administrators when based on identification of management deficiencies and not on the fault of individuals.

Systems Approach and the Safety Concept

My concepts on how to reduce accidents underwent radical change. New ideas began to evolve. Questions were asked: (1) Could all pertinent cause data explaining any reason for the accident be collected on **one source document** (report) and be automated with any degree of success? (2) Could such a report be **designed to document failures within the system** of management rather than merely blaming the individuals involved? and (3) Since the safety officer logically is not the best evaluator of problems in the management system, could the functional managers be required to give expert judgment as to causes for system failures?

My first impressionable contact with the idea of systems safety and its practical application resulted from my assignment as a Naval Reserve Officer in 1959 to the Navy Aviation Safety Center, Naval Air Station, Norfolk, Va. Here I found the systems safety concept being applied at a very high level of management (2-star Admiral) to the improvement of flying techniques and reduction of aircraft accidents. Every Naval aircraft crash is investigated and the details forwarded to the Center for careful examination by a "team" of experts, i.e. educational psychologist, fixed wing specialist, aerodynamics expert, aircraft engine technologist, etc. Each reviews the accident from his own field of expertise, putting the cause data, as he sees it, into the computer. Automated aircraft and pilot failure modes are used to improve flight training methods and to build safer flight equipment, thus saving the Navy and the taxpayer millions of dollars annually.

Interior's "systems safety concept" is designed to isolate deficiencies in the system of management along the same lines as the Navy Aviation Safety Center's approach to system problems in aircraft design and operation. And, I suppose, it approximates the definition of "systems" used by the Aerospace Systems Safety Society.



The term "systems safety analysis" appeared first in support of a concept closely related to space programs. It was made a part of the Department of Defense military specifications requiring the application of systems safety analytical techniques to contracts for hardware. Although the "system," in this sense, has been almost exclusively applied to the complex and dangerous manufacture and manipulation of space products, it widened the break from tradition.

My first exposure to the Aerospace Systems Safety Society was in early 1966, when I received a complimentary copy of "Hazard Prevention" edited by George A. Peters. From what I read and heard about this group, it generally oriented the application of the term "systems" to space hardware. It did not, however, rule out the idea that it could have a much broader meaning.

Col. G. E. Ruff, formerly the Chief, System Safety Engineering Division, USAF Ballistic Systems Division, must have had this in mind when he undertook the difficult task of defining concisely the word "system" as applied to concepts of safety. He said:

"The word 'system' as used in the title Aerospace Systems Safety Society, has evolved and is used in the same sense as that 'system' for which USAF has generated the AFSCM 375 series documents.

"A 'system' is the unification of all component parts of the whole, necessary for the production of a single set of purposive outputs based on proper transformation of inputs in obedience to effective control."

Colonel Ruff also stated that his definition is equally applicable to the universe or to man himself in scope and range. He felt it incumbent on those who use the word "system" to define or bound precisely the limits in which the system operates.

For my purposes, a better definition has been given by R. A. Johnson, F. E. Kast, and J. E. Rosenzweig ("The Theory and Management of Systems," McGraw Hill, New York, 1967, p. 3). They say:

"The systems concept is primarily a way of thinking about the job of managing. It provides a framework for visualizing internal and external environmental factors as an integrated whole.

"It allows recognition of the function of subsystems within which businessmen must operate."

"Systems safety" in the Department of the Interior embraces the concept that good management constantly seeks ways to promote error-free performance, but that this goal—like perpetual motion—may be approached but never quite reached. To reach it would create an industrial utopia.

Management can come as close to approaching error-free performance as it cares to, provided it is willing to spend the necessary time and money. Near-perfection is possible, but it can be very expensive—perhaps too expensive in high-cost and low-benefit situations. As an example, in the national effort to place a man on the moon, we are willing to invest millions of dollars and millions of manhours to accomplish the feat without error. All systems must be "go." All chance of accident must be ruled out.

Can this concept be applied to ordinary work situations such as encountered in the Department of the Interior: Maintaining a school? Building a dam? Killing coyotes? Operating an electrical substation or a National

Park? It most certainly can! Obviously, in these situations, management does not expect the degree of perfection in error-free performance that would be demanded in a spacecraft project. In programs carried out by the bureaus of the Interior Department, all systems do not have to be "go". Some chances can be taken; some accidents can be tolerated. But how many human errors, how many condition defects, how many poor managerial decisions can occur without material effect on the basic mission? At what point must management say, "this many production mistakes and no more!"

There is a limiting point in every industrial enterprise, be it large or small, for the number and cost of performance errors. The utility of system safety management is to identify this point for management. Accidents are symptoms of imperfect performance, substandard conditions, and system deficiencies. Systems safety applied to accident analysis enables management to establish for itself the acceptable levels of error-free performance for any kind of work done. Safety managers are most effective when they can pinpoint managerial weaknesses in both line and staff services where concern with improvement should take constructive action to reduce errors.

EDP and Systems Safety Management

Automation has an important impact on the systems concept, and it's causing a change in loss prevention management. Electronic data processing is eliminating the need for manual handling of accident reports because it introduces a memory bank of facts in minute detail and available at speeds never before dreamed possible. Computers will facilitate the use of operations research techniques for safety specialists, happily changing their image to one more closely identified with high-level functions in the management system.

The machines have extremely large memories and can talk to each other across long lines of communication. Interior's automated safety management information system can isolate in minutes the basic managerial problems in personnel, finance, property, and law, if they are found to be reasons for accidental loss. When matched against the personal experiences of safety officers, the machine usually proves them wrong. Who would have suspected, for example, that in one bureau, schoolteachers are involved in more accidents than laborers or that moving office furniture in the Department is undoubtedly the reason for many costly back strains among administrators?

The computer is exact. The day of "shotgunning" safety programs is nearing its end. If there is a bad frequency of motor vehicle accidents, we don't just run everyone through a driver improvement course. We want to know who is involved, the geographical significance, why collisions occur, and their loss in dollars to management. Cost/benefit studies are vital to decision making. If the cost of the cure is greater than the pain—forget it.

Interior's Safety Management Information System

Key to systems safety management is the full appreciation and understanding that any accident incident is an indicator . . . a warning . . . to the management team that something has gone wrong with the system. And, if the safety administrator can make it clear that he has a positive role in the organization as a systems evaluator,

talented in isolating mistakes in policy, practices, and procedures, he will become a full partner on that "team," not a social worker operating in an organizational vacuum.

To aid him, the Department has introduced a Safety Management Information System (SMIS). The supervisor's report of accident is the Department's official source document for supplying information about performance errors related to the management system. The collective voices of thousands of supervisors and those who review what he says, are fed into the EDP machinery. (IBM-059, Key punch & Verifier; IBM-083 Sorter; IBM-360 Computer). Line safety problems are systematically sorted out into categories (who, what, why, when, and where) and then related to the functions of management (personnel services, property management, management research, fiscal control, legal counsel, etc.: "Department Safety Management Information System, CY 1967" Management Bulletin Publication No. 11, U. S. Department of the Interior, Washington, D.C., March 1968). Data (fallout) extracted from these activity reports provide the framework for diagnosing and "costing-out" the need for management change.

Massive numbers of accidents give clues to problem areas. An area so defined becomes a safety management improvement project (SMIP).

Identifying the Accident Failure Mode

SMIPS are initiated at the assistant secretary level and are made a part of the Department's manpower utilization/cost-reduction program. Bureau directors request fallout data on the failure mode selection. Bureau Safety Managers provide the cost/benefit study. These safety managers then line up the causes for failures with selected managers in the organization and hold a problem-solving session with them. Practical solutions are collected from them and others who are closely involved with the fail-

ure mode and, with this aid, a preventive action project is constructed. Project guidelines are issued to field station officials. Those involved are given the dimensions of management's concern in terms of the loss and what specifically is to be done. Suggestions regarding the project are welcomed as a part of the Department's incentive awards program.

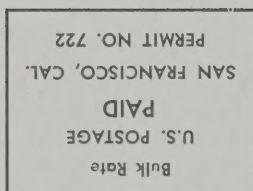
Periodic printouts of the project data are run off to give management a progress report of its effort. If loss is reduced measurably, the line supervisors and staff managers are given credit for the project success—not the safety managers. (They get their reward in heaven . . . and sometimes in higher salaries.)

I feel that the modern safety manager must possess a different group of qualifications than his predecessor. He must be more than an "engineer." He must understand the principles of organizational management, and the functional relationships within the organization. In short, he must know the "system" of management. He must be able to appreciate organizational objectives and understand the differentiation of responsibilities to operational programs. He must be able to enlist the cooperation of other management disciplines on the basis of functional sharing of responsibility. He must stop the all too prevalent stratagem of ingratiating and injecting himself into purely inter-personal relationships.

Today's safety manager must understand that his mission is one of program direction, not specialized technical or engineering competence. He must, in fact, develop his skills to support management, and not be asking constantly for management support.

Through "systems safety" approaches, safety management is now in a vital, new stage of development. It holds a most exciting future for those who will accept it. It has been a pleasure to be associated with progress in a field that holds great promise of assistance to everyone involved.

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